JOURNAL OF THE

American Society of Safety Engineers

CONGRESS ISSUE

NSC—Giant of Safety

(SEE PAGE 8)

CIS

The International Occupational Safety and Health Information Center

THE NEED

In recent years it had become evident that the need for complete and up-to-date information on every aspect of accident prevention and health protection could not be adequately met except through a world-wide, specialized service. To meet this need the International Occupational Safety and Health Information Center (CIS) was founded in 1959 in Geneva, Switzerland, by the International Labour Office, with the collaboration of the International Social Security Association, the support of the High Authority of the European Coal and Steel Community, the European Economic Community and the World Health Organization, and the active participation of 23 specialized national institutions in countries throughout the world. Now more than 30 Centers are participating in the accident prevention information program.

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Subscribers receive information from the CIS on 3" by 5" cards, which are sent out every three or four weeks in English, French and German editions. They also receive, at no extra charge, the other publications of the Center. Only complete sets of cards are supplied. The interdependence of the subjects and the prohibitive cost of sorting to meet individual requirements make it impossible, at present for the CIS to accept partial subscriptions.

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This Month's Cover

• Governor Howard Pyle, president of the National Safety Council, right, shown presenting an Award of Honor to Society President George L. Gorbell at the Society's Annual Meeting October 16 at the Conrad Hilton Hotel, Chicago. The award was made to the Society on the occasion of the Golden Anniversary of the American Society of Safety Engineers for "outstanding contributions the Society has made to the cause of accident prevention over the 50 years of its existence."

READERS Pulse

(Letters for this column are invited from readers on any subject related to safety, or based upon any material printed in THE JOURNAL.)

More Anniversary Letters . . .

Dear Mr. Blackman:

It is a pleasure to extend our hearty congratulations to the American Society of Safety Engineers upon the occasion of its 50th Anniversary next month.

The work done by the Society over the years in safety work generally and in the development of the safety engineering profession in particular is indeed highly commendable and an accomplishment in which you must all be very proud.

ARTHUR W. BAKER
General Secretary
American Transit Association

Dear Mr. Blackman:

America has a reputation for climbing industrial peaks and of this we are justly proud. But now our nation is at its lowest point—and of this we are equally proud—because the point refers to industrial accidents.

The American Society of Safety Engineers has played a major role in the reduction of these accidents and on this, your 50th anniversary, we at General Foods send you our thanks and hearty congratulations.

WAYNE C. MARKS
President
General Foods Corporation

Dear Mr. Blackman:

Upon the occasion of the 50th Anniversary of the American Society of Safety Engineers, we would like to extend our heartiest congratulations.

Your members should be very proud of their record and be commended for the many worth while programs they have conducted over the past fifty years.

J. B. MONTGOMERY
President
Daystrom, Inc.

Dear Mr. Blackman:

As president of our Association I am happy to send congratulations from the American Industrial Hygiene Association to the American Society of Safety Engineers on the occasion of your 50th anniversary. We hold your Society in the highest regard and we are well aware of the many advances you have made in the field of safety engineering and the sound philosophy toward accident prevention you have developed through the years. Industry and this country generally are much better off for the accomplishments of your many members.

Many members of our Association are also members of yours, and we feel there is a close bond between the two organizations, and mutual respect.

We compliment ASSE on achieving its golden anniversary, we extend you best wishes, and we hope that you continue to grow in leadership and influence in the safety movement.

W. G. HAZARD
President
American Industrial Hygiene Ass'n

Dear Mr. Blackman:

On behalf of President W. H. Chase and the membership of the American Institute of Electrical Engineers, let me extend to your officers and members sincere congratulations on your fifty years of service to industry and the public.

N. S. HIBSHMAN
Executive Secretary
American Institute of Electrical Engineers

Dear Mr. Blackman:

It gives me great pleasure to write to the American Society of Safety Engineers on the occasion of its 50th Anniversary.

The great improvement that has taken place in decreasing the likelihood of accidental death or injury in industry in the last fifty years is due in no small part to the program of the American Society of Safety Engineers and the enthusiasm and diligence of its members.

May the American Society of Safety Engineers meet with continued and even greater success.

E. J. MANLEY
President
Allegheny Ludlum Steel Corp.

Dear Mr. Blackman:

Congratulations on your 50th Anniversary! The record speaks for itself.

I am sure that much of the success of our free enterprise system and the outstanding safety record of American business and industry can be attributed directly to the fine work of your society.

May your record be even more impressive during the next fifty years.

DON L. NEER
Executive Secretary
National Industrial Recreation Ass'n

Dear Sir;

May I, representing our Association, extend our congratulations on the observation by the American Society of Safety Engineers of its Fiftieth Anniversary.

This fine group of men belonging to the American Society of Safety Engineers should indeed be proud of the tremendous strides taken by Safety Engineers individually and as a group, in forwarding the cause of safety both in industry and the home during the last fifty years.

Would you be kind enough to extend to all members and all 76 Chapters of the American Society of Safety Engineers our congratulations, and assure them that we as an Association will at all times be only too glad to cooperate in the furtherance of the safety engineering profession.

E. W. BULLARD
President
Industrial Safety Equipment Association

Gentlemen:

Congratulations on your 50th Birthday!

Our Corporation considers safeguarding human life a prime necessity. Knowing of the high purpose of your Society, we are glad to take the occasion of your 50th Anniversary to send every good wish for even greater accomplishments in safety in the future.

GERALD S. TOMPKINS
President
American Viscose Corp.

Dear Mr. Blackman:

Fifty is a good age and a good birthday to celebrate. Congratulations to the American Society of Safety Engineers on its fiftieth anniversary, and best wishes for long-continued success in further reducing the toll of industrial accidents.

DAEL WOLFLE
Executive Officer,
American Association for the Advancement of Science

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Editorial Comment

As I approach the end of my term of office as President of the Society, I would like to highlight some of the year's accomplishments.

This past year witnessed the birth of the official publication of the Society, *The Journal,* issued on a monthly basis. You will recall that *The Journal* was first published quarterly as an in-bound section of the *National Safety News;* and by agreement with the National Safety Council, the Society was not to publish an independent magazine before January, 1962.

To capitalize on the fact that 1961 is the Golden Anniversary of the Society your Executive Committee asked the National Safety Council to amend our agreement with them to allow us to advance *The Journal's* publication date from January, 1962, to October, 1961.

Typical of the fine support and cooperation the Society has always received from the Council and indicative of the excellent relationship between the two organizations, the Council graciously acceded to our request.

The Journal is a real milestone in the history of the Society and should reflect an image of an organization devoted to the furtherance of the safety profession through the provision of valuable technical contributions which will enhance the status of the Society in the technical community.

Another undertaking of consequence which came to fruition after two years of diligent study and many hours of committee work is the revision of the Constitution and By-Laws to streamline the Society's organization and to delineate our objectives in the light of changing concepts of the tasks and problems facing those in the field of accident prevention.

Faced with a leveling off of applications for membership to the Society and with knowledge that there is a substantial number of persons eligible for membership, the Committee on Membership planned and promoted a membership campaign which will go into effect in November and run until the end of the year.

This same committee's work in 1960, which brought about the addition of a Fellow member classification, saw the results of their labors when eight Fellows were elected this year.

Other activities engaged in by Standing and Special Committees include the production of a career guidance booklet, establishment of a Junior Achievement Safety Program, development of an off-the-job safety program for chapter use, study of the feasibility of conducting A.S.S.E.-sponsored safety seminars for the safety professional, revision of the Chapter Achievement Awards Program, cooperation with the American Standards Association Standards Committees, revision of an outline of a college course in safety, and study of the subject of state registration of safety engineers with all of its ramifications.

In addition to its many other tasks, the Staff has, with legal counsel, been working on the establishment of the Society's federal tax status and on the transference of our incorporation from New York to Illinois. The tax status problem has been resolved and we are now classified as a 501 (c) (6) organization for tax purposes.

As you know, by the proxy cards sent to the membership recently, the incorporation of the Society in Illinois is practically a fact by now.

Concerning the Society's financial status, I am happy to report we are solidly solvent with a net worth of more than $70,720. You may recall that it was necessary for us to start the year with a budget deficit of $9,300 in order to meet certain essential predicted expenses connected with the publication of the new *Journal.* I am pleased to report that through careful administration of the budget, this deficit has been wiped out and we are in the black by $95.00.

The addition of the Mississippi Chapter last November brought our total chapter count to 76, and two more chapters, the Nutmeg Chapter in New Haven, Conn., and the greater Tidewater Chapter in Norfolk, Va., have submitted petitions for charters; so, it is quite apparent that the Society's growth will continue.

The opportunity afforded me to participate in Society regional meetings and to learn first-hand the "grass roots" problems of the chapters and to witness the enthusiastic interest of our membership in furthering the safety profession, reassured me that the aims and objectives of the Society will be intelligently pursued and the growth of the Society stimulated to greater heights.

GEORGE L. GORBELL, RETIRING PRESIDENT
AMERICAN SOCIETY OF SAFETY ENGINEERS

Congress Report

ANNUAL AWARDS LUNCHEON

The Philadelphia Chapter has been named winner of the 1961 Alfred D. Caddell Memorial Award for Chapter Achievement. Presentation of the honor, the third consecutive one for the Philadelphia Chapter, was made at the 8th Annual Society Awards Luncheon, held October 17 in the Boulevard Room of the Conrad Hilton Hotel, Chicago.

Established in 1952, the Caddell Memorial Award is the highest honor which the National Society can bestow upon one of its chapters. It is presented to the chapter which has been outstanding in its efforts to advance the science of safety engineering and which tangibly demonstrates this by securing the highest point total in the Chapter Achievement Award Competition.

Each year's Caddell winner is presented with a permanent plaque and podium for use by the chapter at its meetings during the year.

The Philadelphia Chapter now holds the distinction of being one of two chapters to have received the Caddell Memorial Award at least three times, the other being the New Orleans Chapter which was the recipient of the first Award in 1952, again in 1956 and 1957 and tied with the Philadelphia Chapter last year.

This year each of the other seven regions was represented by a chapter winner in the Regional Award Competition. Winners in each region include:

Northeast Region, Boston Chapter.

East Central Region, Western Pennsylvania Chapter.

Southeast Region, Georgia Chapter.

Central Region, Milwaukee Chapter.

West Central Region, St. Louis Chapter.

Southwest Region, Southwest Chapter.

Western Region, San Francisco Chapter.

Winners of this year's Regional Awards have indicated by a high level of chapter activity and sound chapter administration a demonstrated contribution to the field of safety engineering within their regions.

Presidential Certificates of Commendation were awarded to three chapters which have demonstrated a high efficiency in the administration of chapter affairs. These chapters were New Orleans Chapter, West Florida Chapter and South Florida Chapter all of the Southeast Region.

AWARDS LUNCHEON HIGHLIGHTS

- **Philadelphia Chapter wins Caddell Award.**
- **Top Chapters in Regional Award Contest.**
- **Three Chapters win Presidential Commendations.**
- **Technical Paper Award Winners.**
- **New Society President Speaks.**

1961

• Philadelphia Chapter members are shown at the Albert D. Caddell Memorial Award lecturn which they have won for the third consecutive year. From left to right, Arthur H. Christian, Eastern Region vice president; Samuel McKay, Jr., Chapter representative; George W. Truman, Chapter general chairman; George L. Gorbell, immediate past president, who presided at the Annual Awards luncheon; John T. Cappio; and William A. Mulvenna, Jr.

Technical Paper Awards for 1961 were presented by Quincy V. Tuma, president of Veterans of Safety and chief safety engineer with Texaco, Inc., Houston, Texas. The Award, which is co-sponsored by the American Society of Safety Engineers and the Veterans of Safety, was presented for the third year in recognition of outstanding technical papers written by members of either organization and accepted for publication in the *Journal of the American Society of Safety Engineers* during the award year.

• Winners of the 1960-61 Technical Paper Awards hold their plaques as they pose with Quincy V. Tuma, right, president of Veterans of Safety, co-sponsors of the program. From left, they are Robert D. Gidel, Honorable Mention; William E. Tarrants, First Place; John R. Stone, Honorable Mention; and Mr. Tuma. Not present at the luncheon was Thomas H. Rockwell, Second Place winner.

First place in the 1961 competition went to William E. Tarrants, instructor and research associate at the Center for Safety Education, New York University, for his paper entitled "Engineering as a Foundation for Optimum Safety Success." (Mr. Tarrants' paper appeared in the October, 1961 issue of THE JOURNAL.) The first place winner was presented with a $100 honorarium and a plaque.

Thomas H. Rockwell was named second place winner for his paper, "A Systems Approach to Maximum Safety Effectiveness." Dr. Rockwell, professor of Industrial Engineering at Ohio State University, received a $50 honorarium and a certificate.

Honorable Mention certificates were presented to Robert D. Gidel, assistant director for safety, Bureau of Labor Standards, U.S. Department of Labor, for his paper "The Practical Touch," and to John R. Stone, safety director of the Oldsmobile Division of General Motors Corp., for his paper "Making Safety a Part of Doing Business." (Mr. Stone's paper appears in this issue beginning on page 17.)

Retiring President George Gorbell introduced Dr. John V. Grimaldi, consultant, safety and plant protection, General Electric Co., incoming president of the American Society of Safety Engineers to the more than 300 members and guests attending the luncheon.

Dr. Grimaldi, in the name of the entire Society membership, presented Mr. Gorbell with a plaque in recognition of his outstanding service to the Society during his term as president.

President Grimaldi delivered the principal address at the luncheon on "Safety Engineering in a Changing World." (The full text of President Grimaldi's address appears in this issue on page 35.)

Congress Report 1961

ANNUAL MEETING

Presentation to the Society of an Award of Honor by Governor Howard Pyle, president of the National Safety Council, highlighted the Annual Meeting of the Society held October 16 at the Conrad Hilton Hotel, Chicago.

Governor Pyle presented the award to President George L. Gorbell on the occasion of the Golden Anniversary of the American Society of Safety Engineers for "outstanding contributions the Society has made to the cause of accident prevention over the 50 years of its existence."

Retiring President Gorbell addressed the members and reported in detail on the activities of the National Society during his term of office. (Excerpts from the text of President Gorbell's address appears in *Editorial Comment*, page 3.)

A. C. Blackman, managing director and secretary of the Society, introduced the national headquarters staff. He reported on the streamlining of chapter paper work and efforts to simplify the Chapter Achievement Award Program. He also discussed the purchase of equipment for the purpose of serving the membership better and faster during the past year.

A report was made of the proxy vote taken of the entire membership to authorize the elected officers to dissolve the New York corporation and incorporate the Society in the State of Illinois. By an overwhelming majority, the members voted in favor of the proposal.

The proposed revision of the Constitution and By-Laws was submitted to the members present for any additional amendments.

P. W. Logan, vice president of the Southeast Region proposed an amendment to Article XII, Section 2, which stated,

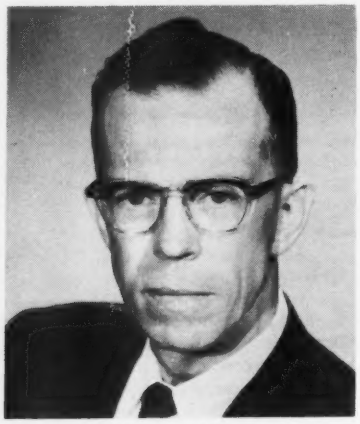
"All members holding elected or appointive office in the Society on the date this Constitution becomes effective, shall continue to serve until their current terms of office expire. The First Vice President shall be known as the President Elect, and the Second Vice President shall be known as the Vice President. All Members-at-Large of the former Executive Committee shall serve as members of the Board of Directors until the next regular annual election."

NEW NATIONAL OFFICERS

JOHN V. GRIMALDI
President

MICHAEL F. BIANCARDI
First Vice President

EDWIN B. LOCKE
Second Vice President



FRANK E. LADERER
Treasurer

A. C. BLACKMAN
Secretary

The amendment was approved and the entire revision, including the proposed amendment, will be submitted in a mail ballot of the membership for final vote within 30 days from the date of the Annual Meeting.

Henry L. Novak, chairman of the Teller's Committee, announced the results of balloting for National Society officers for 1961-62.

New officers elected are John V. Grimaldi, President; Michael F. Biancardi, First Vice President; Edwin B. Locke, Second Vice President; A. C. Blackman, Secretary; Frank E. Laderer, Treasurer; Holly P. Bradley, Lee B. Johnson, W. Eugene Stuffing, Members-at-Large.

Retiring President Gorbell then presented the new officers to the members. Incoming President Grimaldi addressed the meeting on goals for the 1961-62 year and announced appointment of committee chairmen for the coming year. (For a summary of his talk see *On the National Scene*, page 33.)

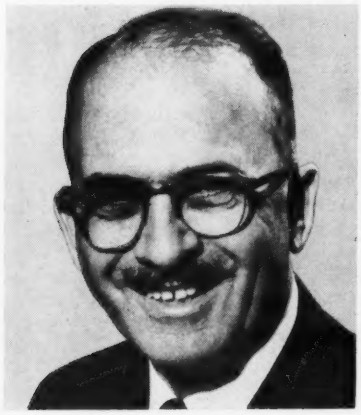
• With smiles and well-wishes, the A.S.S.E. gavel, symbol of the highest office in our Society, is passed on from Retiring President George L. Gorbell, right, to Incoming President John V. Grimaldi at the Annual Meeting last month.

• Henry L. Novak, Greater Chicago Chapter and chairman of the Teller's Committee, announces the results of the membership mail ballot for national officers.

ANNUAL MEETING HIGHLIGHTS

- **NSC Honors Society for 50 Years of Service.**
- **Report on Proxy vote to Incorporate in Illinois.**
- **Constitution Revision Enters Final Stage of Approval.**
- **Results of ASSE Election of Officers.**

NEWLY-ELECTED MEMBERS-AT-LARGE



HOLLY P. BRADLEY
Member-at-Large

W. EUGENE STUFFING
Member-at-Large

LEE B. JOHNSON
Member-at-Large

NATIONAL SAFETY COUNCIL

giant of the

TIME AFTER TIME, I have been asked, "What is the National Safety Council?" And I have found it difficult to give a concise, accurate, and easily understood answer.

These are the words of General George C. Stewart, the Council's Executive Vice President, the man who knows more about the internal clockwork of the organization than anyone else.

"I have, in turn, asked numerous members of the staff—'Describe the National Safety Council.' And the descriptions have been varied, interesting, impressive . . . but all different."

General Stewart goes on to say, "The fact that none of us has exactly the same picture of the Council is not too surprising because we are, of necessity, a complex organization and our activities are as varied as the interests of the people of our country."

What is the National Safety Council?

Some say that it is the organization that forecasts traffic death tolls on major holiday weekends. Others say it is the group that has been working for many years to promote safety in industrial plants. Still others will say it is responsible for collecting and interpreting those statistics that profile the accident prevention picture in America. Even the Council's most severe critics admit that it is the largest organization fighting to keep people from injuring and killing themselves.

It is all of these things—and much more.

"The Council is made up of its members," said General Stewart. "We're really only their staff."

9,000 MEMBERS

There are over 9,000 companies, associations, agencies, schools and individuals that are members of the Council. There are about 3,000 citizen volunteers, who serve on the Council's board of directors, board of trustees, and in 10 safety conferences. There is a professional staff of 370 that works under the direction of these volunteers for the safety of 180 million people.

Broad responsibility for policy rests with the board of directors, made up of leaders from business, education,

associations and government. The trustees, men of highest stature in the business and public life of America, take responsibility, through the Public Trustees Fund, for seeking greater financial support for the Council's work in public areas that are not self-supporting.

Each of 10 program areas is governed by a Conference, which formulates and directs program activities in its field, and coordinates the work of staff representatives.

There are 10 such Conferences:

Industrial
Home
School and College
Women's Organizations
Motor Transport
Traffic
Farm
Labor
State and Local Safety Organizations
Public Information

change its name a year later to the National Safety Council.

This was the beginning of the Council's effort in the field of industrial accident prevention. At that time the staff consisted of two technical employees and less than 100 volunteer workers, meeting no more than once a year.

1,600 VOLUNTEERS

Last year, more than 1,600 volunteers of the sectional executive committees of the Industrial Conference traveled almost two million miles to put in over half a million man-hours at industrial safety meetings.

The cumulative mileage of these committees was equal to 80 trips around the world, and the total number of hours devoted to accident prevention equal to 260 work years.

Since the success of occupational accident prevention depends heavily

The Council defines standards for measuring the safety performance of individuals and fleets, provides recognition for praiseworthy performance and produces the administrative, technical and program materials essential to the conduct of effective accident prevention activities.

An estimated 750 professional drivers will receive Safe Driver Awards this year for their 31 consecutive years of accident-free driving: 23,250 driver years of safety. Never before has so long a span been covered by these awards.

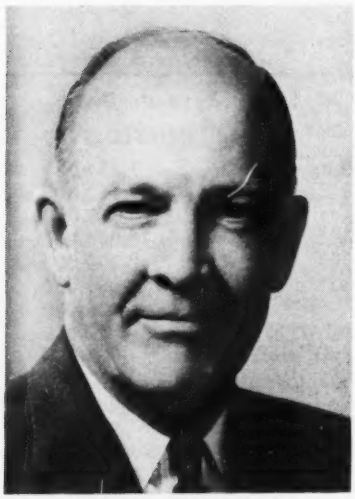
The Motor Transport Conference of the National Safety Council began the awards program in 1930. Since that time, one and one-half million drivers have earned special recognition by conforming to the rigid standards.

The Council's service to the motor transportation industry, aimed at better selection, training and supervision

e safety movement

There are also Church and Youth Committees which perform some of the functions of Conferences.

The newspapers of October 17, 1913, carried a story of a newborn organization, the National Council for Industrial Safety, which was to



GOVERNOR HOWARD PYLE
President

upon training at all levels, the National Safety Council, through the Training committee of the Industrial Conference, continues to stress its importance. During the past year 11 classes of the Safety Training Institute were conducted, with a total enrollment of 241.

As a part of its function in disseminating safety information, the Council publishes 30 Industrial Newsletters, with a monthly circulation of approximately 75,000 copies.

Twenty-six data sheets were published during the past year, dealing with various technical problems, materials and devices. Written by qualified experts and sponsored by Industrial Sections or local chapters of the American Society of Safety Engineers, they constitute a tremendous contribution to the technical literature of the field.

The Motor Transportation Division is concerned with the safe operation on the streets and highways of the 3 million trucks, buses, taxicabs and service cars which are organized into fleets of five or more vehicles, as well as the prevention of industrial injuries to personnel of such fleets.

of drivers, has brought 175,000 drivers up to the rigid standards of the Safe Driver Award in 1960, as compared with 40,000 in 1950.

Standards of fleet safety performance are established each year by the

Please turn page

GENERAL GEORGE C. STEWART
Executive Vice President

participants in the National Fleet Safety Contest, the largest contest of its kind, embracing more than 47 competing groups. Approximately 250 fleets win recognition each year.

The Marcus A. Dow Memorial Award, made possible by a grant from the Greyhound Corporation, recognizes, rewards and fosters high standards of professional achievement in the field of motor transportation safety engineering. Presented each year to the outstanding fleet safety director in the United States and Canada, seven such awards have been made since 1951.

The Council produces and distributes monthly driver training and supervision aids such as bulletins, magazines, cards, stickers, booklets, posters and many other "reminder" materials. Assistance for the fleet safety directors and supervisors is found in Council films, safetygraphs and books of "five minute safety talks."

NSC annually evaluates the Safety Records of 4,700 organizations. Many of them receive an award and national publicity for their achievements.

- ***AWARD OF HONOR—presented to 350***
- ***AWARD OF MERIT—presented to 850***
- ***AWARD OF COMMENDATION—presented to 1000***
- ***PRESIDENT'S LETTER—presented to 875***

The dissemination and exchange of safety information to fleet supervisors is accomplished through the Fleet Safety Manual, monthly newsletters, Traffic Safety magazine, the annual Congress programs of the Commercial Vehicle and Transit Sections and the published transactions. More than 10,000 fleet safety supervisors are reached through these media.

All conferences and administrative divisions of the Council conduct traffic safety work, but the Traffic Conference and the Traffic Division have primary responsibility.

The Traffic Operations section embraces the work of several committees, among them standing committees of the Conference. These are *Winter Hazards, Chemical Tests for Intoxication, Traffic Records, Traffic Statistics, Traffic Education* and *Training, Traffic Courts, Traffic Police*, and *Speed*.

Virtually every element of safety on our streets and highways receives the scrutiny of the engineers and specialists on the Council staff. Phases as varied as chemical tests for intoxication, the hazards of winter driving, driver-licensing requirements, and the rights of emergency vehicles are studied with an eye toward full-scale national improvement of this endless problem.

Of basic importance in the Traffic Conference's efforts is the administration of the Annual Traffic Inventory, a program of appraisal—based on the Action Program of the President's Committee for Traffic Safety.

WHAT INVENTORY MEASURES

The Inventory measures what cities and states do each year in putting the Action Program into effect. Activities reported on are: maintenance of accident records, traffic legislation and ordinances, traffic engineering, police traffic supervision, driver licensing, periodic motor vehicle inspection, school traffic safety education, public traffic safety education, local safety organization, and traffic courts. A written analysis is prepared for each reporting city and state, which points out deficiencies and makes recommendations for improvement.

In the 1961 NSC Annual Traffic Inventory, a record number of 1,276 cities reported on their traffic safety programs. They were joined by 49 reporting states, four metropolitan counties, and the Commonwealth of Puerto Rico.

Carefully graded by staff experts of the Council and cooperating associations, citations are awarded for accomplishment above a certain standard, and a printed analysis, pinpointing strengths and weaknesses and recommending remedial action, is prepared for each jurisdiction.

The analyses are presented by the Council staff at meetings of top officials and representatives of support groups in states and large cities. The Council field staff trains state personnel to present the analyses in smaller cities.

The Traffic Inventory is administered by the Council with the cooperation of the Institute of Traffic Engineers, the International Association of Chiefs of Police, the American Association of Motor Vehicle Administrators, the Committee on Uniform Traffic Accident Statistics, the National Committee on Uniform Traffic Laws and Ordinances, and several committees of specialists in various phases of traffic work. The American Bar Association Traffic Court Inventory is a part of the Traffic Inventory, but it is entirely administered by the association.

Government is served in many other important phases of accident prevention—development of codes and standards, the drafting of model legislation, and the preparation of regulations. While the Council cannot engage in lobbying activities, its spokesmen have frequently appeared before legislative bodies and committees to provide factual background on specific bills concerning safety.

CONSULTS WITH ARMED FORCES

The Council consults with the armed forces and prepares special safety material both for training and off-duty purposes—an educational channel of great importance because of the age group involved.

In another important phase of Traffic Conference activity, the joint seat belt program of the National Safety Council, the American Medical Association, and the U.S. Public Health Service built its first stage

NSC has 5,100 different items of Safety Data available

TYPE	SHIPPED 1960
Manuals and Technical Publications	1,234,000
Magazines and Newsletters	3,760,000
Employe Magazines	11,339,000
Posters	10,000,000
Books and Leaflets	8,300,000
Incentive Merchandise	693,000
Calendars	429,000
Visual Aids (films and safetygraphs)	12,000
Miscellaneous (record forms, decals, stickers, etc.)	1,081,000
Total (Units Safety Materials Distributed Annually)	36,849,000

ALSO

- **44,000 orders received**
- **2,717,000 pieces of mail sent**
- **167 tons of material shipped**

on the education of the members and staffs of the three organizations. Many companies, as part of their off-the-job safety campaigns, are now promoting seat belts.

The seat belt program has now entered its second stage—the education of the motoring public on the effectiveness and value of seat belts—under the impetus of the automobile manufacturer's decision to provide all 1962 cars with anchorages for installing belts.

Governmental agencies—Federal, state and local—have legal responsibilities for many accident prevention programs. Government thus becomes an active participant in National Safety Council work of all types.

ASSISTS PUBLIC AGENCIES

The Council serves government by providing a framework for voluntary coordination, by measuring and evaluating programs and performance, and, most important, by helping to create a climate of public opinion favorable to forceful and effective action by public agencies.

The principal victims of home accidents are elderly people and young children. The Home Safety Conference, serving as the meeting point for national, state and local agencies interested in home safety, is seeking a solution to the problems of safety for children and the aged.

This Conference helped plan the recent White House Conference on Aging, and produced and distributed background material on all aspects of accidents among the aged.

Active and effective child safety programming is well illustrated by the development of Poison Control Centers and programs throughout the United States. Begun less than eight years ago as a pilot project in Chicago, the program now has 440 hospitals participating throughout the nation.

Emphasis on home safety in a community program on the part of official, volunteer, civic and business and industry groups is fostered through the Home Safety Inventory, setting a standard by which the effectiveness of community efforts may be measured.

UNIFORM DEFINITIONS

A persistent and vexing problem is the collection and interpretation of data on non-fatal home injuries. Acceptance of the new publication, Uniform Definitions of Home Accidents, has been gratifying. In addition, through joint effort of the Council, the American Public Health Association and the U. S. Public Health Service, some progress has been made toward uniform reporting and classification of injury data. Uniform reports, consistent coding, and comparable statistics on injuries are still far from actual accomplishment.

● A visitor to the National Safety Council headquarters in Chicago pauses to study the Charter granted to the Council by an Act of Congress and signed by President Eisenhower in August, 1953. In it the Council's objectives are outlined—to further, encourage and promote safety protection and health for workers and children in industry, on farms, in schools, homes, on streets and highways, in recreation; to disseminate educational and informational data; to arouse the interest of the people in safety; to organize and conduct programs and to develop the cooperation of all persons and organizations interested in safety.

SCHOOL ACTIVITIES

The Council's school activities, directed by an energetic conference of educators, encompass virtually every facet of elementary, secondary and college curriculum and administration. They are supported by a wide variety of teaching materials, data sheet, standards and recommendations, and informational bulletins. Staff representatives work closely with educational associations and participate in their conferences and training institutes.

The Council seeks to introduce pedestrian, home and play safety into the classroom in the early elementary grades. Safety is progressively woven into such subject areas as home economics, science and shop training. Take-home materials and home projects requiring parent assistance channel much of the instruction to family adults.

At the high school level, in addition to attention to the general curriculum and vocational training, the Council vigorously promotes driver education. The Council has encouraged insurance advantages for trained drivers, supported state financial aid for driver education, and strenuously opposed some educators and legislators who would eliminate it as an unnecessary frill of public education.

STUDY PUPIL SAFETY

The safeguarding of pupils and students while under school jurisdiction is a principal activity of the Council. The American Society of Safety Engineers devotes time to the inspection of school shops. The safety of classroom building and residence housing from fire and other hazards, the danger-proofing of playgrounds, the proper equipment and supervision of organized sports, the protection of school street crossings, and the sensible administration of automobile use on college campuses have been studied by staff and conference committees, resulting in recommended procedures.

Please turn page

More than 5,000 schools received the Council's Honor Roll certificate last year. National College and University Safety Awards will become effective for the 1961-62 academic year.

The wide interest of women in safety is reflected by the membership of the Women's Activities Conference of the Council. Women's clubs, auxiliaries, women's committees of safety councils, church groups, professional organizations and women prominent in business and civic affairs have come together in the Conference to find greater understanding of the problem, stimulate greater activity, and develop a broad awareness on the part of all women of the opportunity and obligation to make safety a family affair.

"One of the ways the Women's Conference can best serve the needs of women," says Mrs. Raymond Sayre, of Ackworth, Iowa, NSC Vice President for Women, "is to give these volunteer organizations help in determining the safety needs in state and local situations, in order to stimulate more participation."

SUPPORTS PROGRAM DIVISIONS

During the past year, the Women's Activities Division has supported the program divisions and served as liaison between them and national women's organizations on various program activities. It has cooperated in the Traffic and Home Inventories and in the local safety council appraisal program, and administered the Carol Lane award program, made possible by the Shell Oil grant, in which women's organizations and individual women are recognized and rewarded for outstanding traffic safety activities.

Recognition for work in home, public, and traffic safety is now available to women's and parents' organizations through the Women's Conference Citation Awards program.

Since its inception 17 years ago, the National Conference for Farm Safety has demonstrated leadership in the fight against accidents to farm people. Thousands of volunteers have vitalized safety through state and county committees and farm and rural women's groups, making safety an everyday part of rural living.

11,000 FARM DEATHS

"For those who think of the farm as a place for peace and quiet, it comes as something of a shock to learn that farming is one of the most dangerous occupations," says Harry L. Powell, chairman of the Council's National Conference for Farm Safety.

Accidents kill one farm resident every 45 minutes, and every 32 seconds a farm resident suffers a disabling injury.

In spite of the fact that farming continues to claim more lives accidentally than any other major industry, with 11,000 deaths and 1 million injuries in 1960, substantial reductions have been achieved in both rate and number of accidents.

Farm accidents have been reduced an impressive 84 per cent in New Hampshire, 28 per cent in Minnesota and 47 per cent in Wisconsin. These results have been accomplished since 1943.

The Conference, with broad national representation of agricultural leadership, directed the organization of State Farm Safety Committees in 46 states. These state committees have become the wellspring of the family-oriented programs which reach rural youth, farm homemakers, and the agricultural worker.

FARM SAFETY WEEK

Cooperative educational efforts with government are typified by National Farm Safety Week, in which the Department of Agriculture takes part, and the 1960 launching of a special educational campaign to promote use of auto seat belts, cosponsored by the U. S. Public Health Service, the American Medical Association and the Council.

A large number of Safe Practice Leaflets has been produced, usually published first in the *Farm Safety Review* and reprinted for wider distribution. Other materials include special releases for farm publications, recorded farm safety messages for radio and television, and farm safety program aids for rural people.

The Farm Division served in a consulting capacity at a series of agricultural meetings held in conjunction with the four President's Committee regional traffic safety conferences.

The labor safety program of the National Safety Council includes activities in occupational, traffic and other major areas of accident prevention. The Labor Conference, which is the program group for labor members, was established in 1956

- ***NSC was founded in 1913—chartered by the Congress of the United States in 1953.***
- ***Over 300 local Safety organizations are affiliated with NSC.***
- ***1500 men and women serve without pay on the boards of directors and trustees, on conferences and committees.***
- ***NSC has a full time staff of 375 with more than 100,000 square feet of office space.***
- ***NSC has income of $5.8 million annually used to further the cause of accident prevention.***

• The first view of National Safety Council headquarters to visitors is this attractive reception room. On the wall (right) is a giant mural-graph showing the decline in accidents over a period of years.

and now has a membership of 55, composed largely of representatives from national and international unions.

Labor members now number about 325, including national and international unions, state and local central bodies and local unions. The AFL-CIO urges all affiliates to become members and many international union presidents actively promote membership by local unions.

HELP LOCAL UNIONS

The National Safety Council's Labor Conference program is especially aimed at helping the local union, the key in labor safety work. Materials are prepared to assist unions in conducting activities in the program effectively.

The Labor Safety newsletter is now issued bi-monthly to all labor members. Consultation services are being utilized by an increasing number of unions.

NSC HAS SAFETY PROGRAMS IN THESE ESSENTIAL AREAS

- *Accident Prevention*
- *Industrial*
- *Motor Transportation*
- *Traffic*
- *Home*
- *Farm*
- *Recreational*
- *Research & Statistics*
- *Youth*
- *Women's Activities*
- *Labor*
- *Field Service*

(Assistance for Local Safety Organizations)

While labor's interest has been largely in occupational safety, program activities have expanded rapidly in off-the job safety. The labor sessions at the four regional safety conferences sponsored by the President's Committee for Traffic Safety were well attended by labor officials, particularly from state and local central labor bodies. Outstanding labor officials appeared on the programs.

UNION COMMITTEEMEN

Safety training courses for union safety committeemen and other union officials were frequent during the past year. Union safety committeemen also participated in classes sponsored for plant and insurance company personnel and others interested in accident prevention.

Some unions also sponsored safety and health conferences on a district and statewide basis, as well as participating in state and regional conferences sponsored by safety councils and other safety organizations.

The Labor Conference of the National Safety Council continues to maintain close liaison with the Standing Committee on Safety and Occupational Health of AFL-CIO, the Safety Division of the United Mine Workers of America, the Railway Labor Executives Association and federal and state Departments of Labor.

The Conference of State and Local Safety Organizations and the Field Service Department seek to further accident prevention work through organized safety programs in states and communities.

Accidents occur throughout the land, and one of the ways to identify and correct hazardous local conditions and build support for official action is through safety councils in states and cities.

ENCOURAGE LOCAL GROUPS

Influencing the formation of local organizations, upgrading and assisting existing ones, and through them bringing the full weight of the national safety resources to bear on local problems is an important activity of the Council.

Field men are located strategically throughout the country to give on-the-spot trained assistance and counsel to citizen groups and officials.

Eighty state and local safety organizations, serving almost two-thirds of the nation's population, have been accredited by the Council's Board of Directors as worthy of financial and other support. Accreditation is granted or withdrawn on the basis of continuing appraisal of program and management.

9,100 COUNCIL MEMBERS

Employers—6,200

- INDUSTRIAL
- CONSTRUCTION
- PUBLIC EMPLOYE
- COMMERCIAL VEHICLE
- INTERNATIONAL TRANSPORTATION

Occupational Non-Employers —1,200

- ASSOCIATIONS
- LABOR UNIONS
- INSURANCE COMPANIES
- INSURANCE AGENCIES

Non-Occupational—1,700

- EDUCATIONAL GROUPS
- TRAFFIC GROUPS
- TRAFFIC AUTHORITIES
- CIVIC ORGANIZATIONS
- INDIVIDUALS

Formal training is provided by the National Safety Council to local safety council managers and staffs in the form of institutes and seminars.

So widespread is the concern for accident prevention that nobody knows how many independent local safety organizations exist in the United States. Some experts have estimated their number at close to 1,000. In a recent survey taken in the state of Ohio, some 20 small safety councils were discovered which had not been tabulated before.

250 NSC AFFILIATES

These were mostly small committees of public-spirited citizens who had taken it upon themselves to correct some hazardous conditions in their own areas. Often, once such problems are solved the independent safety council dissolves.

Among the more permanent and well-organized accident prevention groups, there are about 250 affiliates to the National Safety Council. Eighty-one of these are accredited with full-time staff workers. The bonding link between NSC and the local councils is the Council's field service representative.

There are 29 members of the field service staff, which includes 17 district directors, located strategically throughout the country.

A major function of the field staff is to present and discuss analyses of state and major city reports in the Annual Inventory of Traffic Safety Activities.

In 1954 the traffic analysis service was provided to 46 states and 178 cities; in 1957 it was received by 47 states and 645 cities. Analyses are presented directly by the Council staff in all reporting states and major metropolitan centers.

Personnel of appropriate state agencies are trained by the field men to provide a comparable service in the small communities of the state. In 1957 a total of 197 employees of state and local agencies in 37 states were recruited and trained. Several local safety councils also assist in presentations.

APPRAISAL SERVICE

The major activity of the Conference of State and Local Safety Organizations during the past year has been the application of standards, covering all phases of local council organization and operation, through appraisals conducted with the assistance of the field staff. Eighty-seven state and local organizations re-

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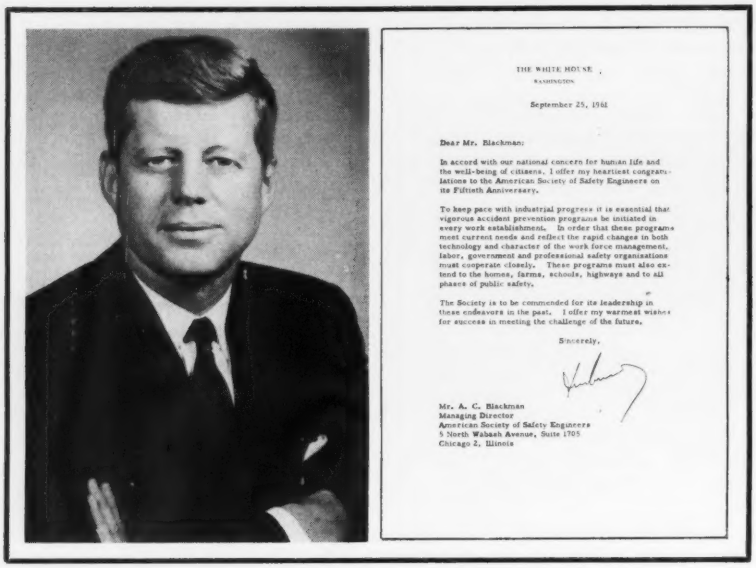


THE WHITE HOUSE
WASHINGTON

September 25, 1961

Dear Mr. Blackman:

In accord with our national concern for human life and the well-being of citizens, I offer my heartiest congratulations to the American Society of Safety Engineers on its Fiftieth Anniversary.

To keep pace with industrial progress it is essential that vigorous accident prevention programs be initiated in every work establishment. In order that these programs meet current needs and reflect the rapid changes in both technology and character of the work force management, labor, government and professional safety organizations must cooperate closely. These programs must also extend to the homes, farms, schools, highways and to all phases of public safety.

The Society is to be commended for its leadership in these endeavors in the past. I offer my warmest wishes for success in meeting the challenge of the future.

Sincerely,

Mr. A. C. Blackman
Managing Director
American Society of Safety Engineers
5 North Wabash Avenue, Suite 1705
Chicago 2, Illinois

SOCIETY LAUDED ON 50th ANNIVERSARY

HUNDREDS of letters, telegrams, scrolls and proclamations have been streaming into National Headquarters citing the Society for its achievements during the past 50 years and extending congratulations on our Golden Anniversary during the past month.

Heading the list was a letter from President John F. Kennedy in which he said in part:

> In accord with our national concern for human life and the well-being of citizens, I offer by heartiest congratulations to the American Society of Safety Engineers on its Fiftieth Anniversary . . .
>
> The Society is to be commended for its leadership . . . in the past. I offer my warmest wishes for success in meeting the challenge of the future.

A letter was also received from the Apostolic Delegate in the United States, His Excellency, the Most Reverend Egido Vagnozzi, extending in the name of Pope John XXIII "every prayerful best wish for the continued success of the work which the Society has taken upon itself."

Arthur J. Goldberg, Secretary of Labor, wrote commending the Society for its leadership in the areas of accident prevention.

Scrolls and citations of honor were received from the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the American Society of Civil Engineers, and the American Institute of Mining, Metallurgical and Petroleum Engineers.

In Illinois, a Proclamation was issued by Governor Otto Kerner, designating October 8 as "Safety Engineers Day" in honor of the National Society which is headquartered in the State and the Greater Chicago Chapter. Mayor Richard J. Daley also issued a similar proclamation in the City of Chicago.

Nearly 150 business and industrial firms sent letters of congratulations to the Society. Most of them came from the office of the president or chairman of the board and expressed the company's gratitude to the Society and its members for the many achievements in the field of accident prevention.

Many letters were also received from safety organizations, insurance groups, engineering and professional societies, trade associations and medical and educational organizations.

(EDITOR'S NOTE: Several of these letters have been reprinted in the *Readers Pulse* Column in the October and current issues of the *Journal.)*

Reports of chapter activities on behalf of the Society's 50th Anniversary were beginning to come in to the National Headquarters at the time this issue went to press.

The Fort Worth Chapter arranged with Mayor John Justin Jr. for the issuance of a proclamation in honor of the Society's Anniversary. In addition, the Fort Worth Chapter planned a series of televised safety speeches by members during the week of October 8-14. The chapter also offered its services as safety counselor to Fort Worth Area public schools.

Through the combined efforts of the Philadelphia, Western Pennsyl-

● Illinois Governor Otto J. Kerner proclaimed October 8 as "Safety Engineers Day" in the state honoring the 50th Anniversary of the founding of the Society. Shown receiving the Governor's official proclamation are, left to right, A. C. Blackman, Society managing director; Joseph Stech, managing director, Greater Chicago Safety Council; Sam Bernstein, Acting State Commissioner of Labor, making the presentation; John E. Appel, chairman, Chicago Chapter; Henry L. Novak, secretary; and Theodore F. Wickord, treasurer.

● Governor David L. Lawrence is shown signing an official proclamation declaring October 8 as "Safety Engineers Day" in Pennsylvania. Seated to the left of the Governor, Arthur H. Christian, vice president, Eastern Region. Standing are, left to right, Norman Hughes, chairman, Delaware County Chapter; George Truman, chairman, Philadelphia Chapter, and George Orth, chairman, Western Pennsylvania Chapter. Seated to the right of the Governor is Myron L. Miller, vice president, East Central Region.

vania and Delaware County Chapters, Governor David L. Lawrence of Pennsylvania issued a proclamation commemorating the 50th Anniversary of the Society.

The Philadelphia Chapter plans to celebrate the 50th Anniversary on December 4 at the Engineers' Club of Philadelphia. President of the City Council James H. J. Tate will be the principal speaker and will present a resolution of the City Council congratulating our Society on its contributions to the preservation of life and property.

The South Florida Chapter reported that proclamations were issued by Mayor Robert King High of Miami; Mayor Robert L. Searle of Coral Gables; Mayor William G. Zinkil, Sr., Hollywood (Fla.); and Mayor Richard Calhoun of Miramar. The chapter's observance of the occasion also included dinner celebrations in cooperation with local organizations.

As a result of efforts of members of the Central New York Chapter, a proclamation in honor of the 50th Anniversary of the Society was issued by Mayor Anthony A. Henninger of Syracuse. The signing of the proclamation was recorded by both of the city's television stations.

Members of the Genesee Valley Chapter report that a proclamation in honor of the Society has been issued by Mayor Peter Barry of Rochester.

General Chairman Edward J. Baird and Vice Chairman Michael L. Tackney of the New Orleans Chapter reported a Mayor's proclamation had been issued in New Orleans by Mayor Victor H. Schiro while the Chattanooga Chapter also reported a proclamation had been issued by the mayor of Chattanooga.

Stories and articles about the Society's 50th Anniversary have appeared in many magazines and publications throughout the country. In the October issue of *Safety Maintenance* magazine, the entire editorial page was devoted to the Society's Anniversary. The editorial stated in part:

> As the recognized leaders in the more scientific phases of accident and fire prevention, this truly dedicated group of hard-core experts is constantly on the alert. In the years to

Please turn page

● Mayor Robert King High of Miami, Florida presents official proclamation making October 8 "Safety Engineers Day" in the City of Miami. Left to right are, Jack Thaler, general chairman, South Florida Chapter, receiving the proclamation on behalf of the Society; Albert J. Sziarto, South Florida Chapter; Mayor Robert King High; and Charles W. Seifert, South Florida Chapter.

● South Florida Chapter celebrates the 50th Anniversary of the Society at a commemorative dinner. Chapter members are shown with Life Members Tom Walsh and Rudy Epstein standing to the left of General Chairman Jack Thaler. General Chairman Thaler holds the proclamation presented by Chapter member John F. Lawton, extreme right, on behalf of Mayor William Zinkil of Hollywood.

Society lauded continued

come, it will bring still further influence to bear for a more widespread appreciation of safety in this and other countries where human life is fortunately still viewed as the world's supreme resource.

A complete list of companies and organizations from whom letters have been received follows:

Automotive Exhaust Research Institute
Windle F. Jarvis, Executive Secretary

National Safety Council
Howard Pyle, President

National Industrial Recreation Assn.
Don L. Neer, Executive Secretary

The Traffic Institute
Bernard R. Caldwell, Director

Industrial Accident Prevention Assns.
R. G. D. Anderson, General Manager

Society of Automotive Engineers
A. A. Kucher, President

Daystrom, Incorporated
J. B. Montgomery, President

Engineering Society of Detroit
Frank G. Horton, Managing Director

General Foods Corporation
Wayne C. Marks, President

United Merchants and Manufacturers
Michael R. Morano, Personnel Director

The Champion Paper and Fibre Co.
Karl R. Bendetsen, President

American Nuclear Society
W. B. Lewis, President

Monsanto Chemical Company
Chas. H. Sommer, President

American Paper and Pulp Association
James E. Jones, Director

Technical Assn.—Pulp and Paper Industry
Harold H. Annis, President

American Institute of Electrical Engineers
N. S. Hibshman, Executive Secretary

American Transit Association
Arthur W. Baker, General Secretary

International Shoe Company
Henry H. Rand, President

Farmers Mutual Automobile Insurance Co.
Irving J. Maurer, President

American Industrial Hygiene Assn.
W. G. Hazard, President

Allegheny Ludlum Steel Corp.
E. J. Hanley, President

Scovill Manufacturing Company
Selden T. Williams, President

Metropolitan Life Insurance Co.
Cecil J. North, President

American Welding Society
Fred L. Plummer, National Secretary

The Upjohn Company
E. Gifford Upjohn, M.D., President

American Society of Tool and Manufacturing Engineers
William Moreland, President

Zenith Radio Corporation
Joseph S. Wright, President

Diamond National Corporation
Richard J. Walters, Executive Vice President

Skelly Oil Company
Don H. Miller, President

Aluminum Company of America
Lawrence Litchfield, Jr., President

Associated General Contractors of America
James D. Marshall, Executive Director

General Precision Equipment Corp.
D. W. Smith, President

Reynolds Metals Company
R. S. Reynolds, Jr., President

International Harvester Company
Frank W. Jenks, President

Celanese Corporation of America
Harold Blancke, President

Socony Mobile Oil Company
A. L. Nickerson, President

American Oil Company
L. W. Moore, President

Anaconda Wire and Cable Company
Richard B. Steinmetz, President

E. I. DuPont de Nemours & Co.
C. H. Greenewalt, President

Kellogg Company
L. C. Roll, President

Society of Exploration Geophysicists
J. P. Woods, President

International Assn. of Chiefs of Police
Quinn Tamm, Director, Field Service

National Gypsum Company
Fred A. Manske, President

American Association of Textile Chemists and Colorists
Elliott Morrill, President

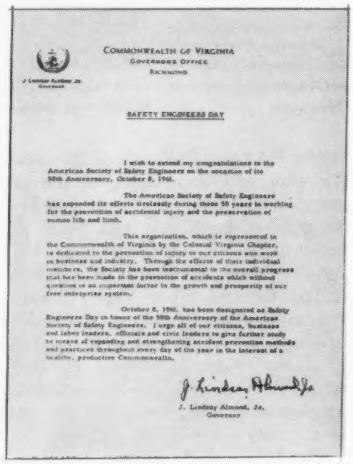
The Ohio Oil Company
G. K. Barrett, Manager

Parke, Davis & Company
Thomas C. Anderson, Vice President

The White Motor Company
J. E. Adams, Executive Vice-President

American Management Association
David J. Secunda, Vice President

Borg-Warner Corporation
Robert S. Ingersoll, President



COMMONWEALTH OF VIRGINIA
GOVERNOR'S OFFICE
RICHMOND

J. Lindsay Almond, Jr.
Governor

SAFETY ENGINEERS DAY

I wish to extend my congratulations to the American Society of Safety Engineers on the occasion of its 50th Anniversary, October 8, 1961.

The American Society of Safety Engineers has expended its efforts tirelessly during these 50 years in working for the prevention of accidental injury and the preservation of human life and limb.

This organization, which is represented in the Commonwealth of Virginia by the Colonial Virginia Chapter, is dedicated to the prevention of injury to our citizens who work in business and industry. Through the efforts of these individual members, the Society has been instrumental in the overall progress that has been made in the prevention of accidents which without question is an important factor in the growth and prosperity of our free enterprise system.

October 8, 1961, has been designated as Safety Engineers Day in honor of the 50th Anniversary of the American Society of Safety Engineers. I urge all of our citizens, business and labor leaders, officials and civic leaders to give further study to means of expanding and strengthening accident prevention methods and practices throughout every day of the year in the interest of a healthy, productive Commonwealth.

J. Lindsay Almond, Jr.
Governor

• Official proclamation from Governor J. Lindsay Almond of Virginia naming October 8 as "Safety Engineers Day" throughout the State.

Phillips Petroleum Company
Paul Endacott, President

American Motors Corporation
William H. McGaughey, Vice President

Swift & Company
P. M. Jarvis, President

National Coal Association
Harry Gandy, Jr., Director—Safety

Employers Mutuals of Wisconsin
J. M. Sweitzer, President

The Glidden Company
Dwight P. Joyce, President

Textron
George W. Miller, President

Hartford Accident and Indemnity Co.
J. C. Hullett, President

Eastman Kodak Company
W. S. Vaughn, President

AAA Foundation for Traffic Safety
Clarence E. Bodie, President

Koppers Company, Inc.
F. L. Byrom, President

Goodyear Tire & Rubber Company
R. DeYoung, President

American Society of Lubrication Engineers
Donald B. Sanberg, Executive Secretary

American Hospital Association
Edwin L. Crosby, M.D., Director

Liquefied Petroleum Gas Assn.
E. O. N. Williams, President

Vulcan Materials Company
Bernard A. Monaghan, President

Sperry Rand Corporation
Harry F. Vickers, President

Acme Steel Company
G. Findley Griffiths, President

Scott Paper Company
Robert I. Thieme, Vice President

Harleysville Insurance
Arthur A. Alderfer, President

Dan River Mills, Inc.
William J. Erwin, President

Westinghouse Electric Corp.
Mark W. Cresap, Jr., President

American Steel Foundries
Joseph B. Lanterman, President

Radio Corporation of America
John L. Burns, President

National Society for the Prevention of Blindness
James E. O'Neil, Director of Industrial Service

General Motors Corporation
John F. Gordon, President

Texaco, Inc.
J. W. Foley, President

Raytheon Company
Richard E. Krafve, President

Crucible Steel Company of America
Joel Hunter, President

Kaiser Aluminum & Chemical Corp.
D. A. Rhoades, President

Corning Glass Works
Amory Houghton, Jr., President

Minnesota Mining & Manufacturing Co.
Herbert P. Buetow, President

The National Board of Fire Underwriters
Assistant Secretary

Gulf Oil Corporation
E. D. Brockett, President

Burroughs Corporation
Ray R. Eppert, President

Institute of Traffic Engineers
Alger F. Malo, President

Yale & Towne Manufacturing Co.
A. Clifford Thornton, Vice President

American Society for Metals
Allan Ray Putnam, Managing Director

American Home Products Corp.
Lowell F. Johnson, Vice President

The Atlantic Refining Company
Henderson Supplee, Jr., President

New York University Center for Safety Education
Walter A. Cutter, Director

The Coca-Cola Company
John C. Staton, Vice President

Owens-Illinois
C. R. Megowen, President

Continental Oil Company
L. F. McCollum, President

Standard Oil Company of California
T. S. Peterson, President

Sun Oil Company
Robert C. Dunlop, President

International Telephone and Telegraph Corp.
Harold S. Geneen, President

Western Electric Company
H. I. Romnes, President

Crown Zellerbach Corporation
R. O. Hunt, President

America Fore Loyalty Group
William H. Berry, Vice President

Union Oil Company of California
Dudley Tower, President

Johns Manville Corporation
C. B. Burnett, President

American Nurses Association, Inc.
Mathilda Scheuer, R. N., President

Rockwell Manufacturing Company
E. F. Foubert, Vice President

Weyerhauser Company
Norton Clapp, President

Whirlpool Corporation
R. E. Brooker, President

The American National Red Cross
E. Roland Harriman, Chairman

Allied Chemical Corporation
Chester M. Brown, President

Society of Fire Protection Engineers
W. J. Baker, President

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TECHNICAL SECTION
A.S.S.E. Journal—November, 1961
Volume VI Number 5

Making Safety a part of doing business

by John R. Stone

IT IS UNFORTUNATE for today's safety engineer that the frequency and severity formulas were ever invented. The trouble with these two factors is that they have outlived their usefulness.

In the early stages of accident prevention, frequency and severity were probably adequate as safety ratings. It is not difficult to see how, starting from scratch, any serious general attempt to prevent accidents would be accompanied by a corresponding reduction in lost time accidents.

There is no question that the introduction of workmen's compensation liability had a lot to do with the origination of the frequency and severity formulas.

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It can be understood why, during the first giant step by the employer from a position of willful disregard of accidents to this new state of forced selective concern, emphasis was placed only on those accidents for which the employer had to pay.

These accidents were the ones causing the employe to lose time from his work; the ones where the employe was seriously injured and where the employer was held financially responsible.

It is then a fair conclusion that safety records, since they are based only on lost time accidents, frequency and severity, are actually not intended to give a well-rounded picture of the attention being given safety today.

If accurate records are kept of all injuries, both serious and superficial, it will be found that about one tenth of one per cent of them will be of consequence from the standpoint of employe disability. This percentage would be fairly accurate in any plant or business where a well-established safety program is in effect.

Safety records then deal with only one tenth of one per cent of the average accident experience in modern business and industry and any conclusions based entirely on safety records is biased and unrealistic.

In working with foremen in a safety program, there are several important responses necessary

from them. There are also a few responses that cannot be tolerated from them. For example, it is essential that foremen develop and maintain a high degree of interest in the program. It is also necessary that they expand their comprehension of safety hazards and safe practices. On the other hand, complacency on the part of a foreman with respect to safety is a response warranting immediate attention by both the safety engineer and the foreman's supervisor.

At the present rate of occurrence, lost time accidents and safety records are apt to bring about complacency!

A foreman will not respond to safety action and changes in his department when he has a perfect safety record with no lost time accidents. He is much more inclined to want to leave well enough alone and his department remains status quo—not safety-wise but lost time accident-wise.

EMPHASIZE HAZARD CONTROL

Most foremen will admit that they can prevent many accidents through the elimination of hazards and the proper supervision of employes. This being the case, it appears that emphasis should be placed on the elimination or control of hazards along with the promotion and recognition of safe work procedures by employes.

To the foreman, the very person who is expected to recognize any hazardous condition, frequency and severity are confusing. The foreman cannot see a direct ratio between how hard he works at safety and how good a safety record he can establish.

On the other hand, give him a problem which will obviously have an eventual bearing on the safety record and he will give his utmost to arrive at a solution. Then, by all means, his work in behalf of safety should be acknowledged.

This approach is positive because tangible factors are being dealt with. The foreman wants his rating based on matters over which he has control and won't stand still for something as intangible as the safety record.

DEAL IN TANGIBLE TERMS

So if you wish to get foremen active in your safety program, deal with them in terms of the tangible and measurable aspects of safety and let the safety record take care of itself.

I am sure many safety engineers will take exception to what I am about to say but I feel that safety contests and campaigns are of little value in safety work. When a safety program is set up for the first time in a plant, those in charge of the administration and interpretation of the program must decide upon certain objectives for safety in the plant.

Such objectives would include definite programs such as eye protection, safety shoes, machine guarding, die guarding, safety and fire prevention inspections, safe practices written for each occupational group and many others. Obviously, these are long range objectives some of which will take considerable time to implement.

If the diversified components of the total safety program are introduced and supervised in a manner which will cause them to live on and on, much time and many people will be involved.

SAFETY RULES TAKEN LIGHTLY

It is true that safety axioms and object lessons which are the basis for all safety objectives are often taken lightly by those not completely familiar with the safety problem. It must also be acknowledged that in some cases, those in closest contact with the accident problem are the least impressed by accident prevention propaganda.

There could be none closer to the scene of the safety problem than the man on the machine and his foreman and the entire safety program must be planned to reach these two groups with the greatest impact.

Generally speaking, the working force in business and industry is not greatly influenced by fantasy. They prefer to deal with realistic factors, things they can see and touch and account for physically. They are paid to perform specific jobs such as run a machine, assemble a product, or take care of a specific assignment in a business. They understand the rudiments of their jobs and accept without question any related work assignments.

On the other hand, they are quick to reject anything not comprehended as part of their work. This is really not an objectionable characteristic. Leaders in business and industry should be grateful indeed that there is such a common denominator in the evaluation of menial work assignments by their subordinates.

ANY REASONABLE CHALLENGE

No matter how fantastic business forecasts might seem to these "little people," they can always be relied upon to dig in and do their very best. Where the tangible aspects of their jobs are concerned, they will tackle any reasonable challenge.

What does this have to do with safety campaigns?

In the first place, what is safety? Safety could be defined as being void of danger or absence from injuries. If that isn't intangible, nothing is. Who wants to be void of anything? Accident prevention on a campaign basis is not only a dubious approach but is also confusing because of inconsistencies which are bound to show up during such campaigns.

In a campaign, a single "one time" objective is set up. For example, in a political campaign, the objective would be to get people to vote for a particular candidate. Campaign slogans, songs, banners and speeches are combined to arouse the interest of voters.

The drums beat harder and louder as election day draws nearer and the whole campaign ends with a

SEVEN IMPORTANT STEPS IN MAKING SAFETY A PART OF DOING BUSINESS

- **Establish definite plant safety standards.**
- **Plan safety into each job and provide facilities.**
- **Clearly outline each employe's safety responsibility.**
- **Supervise according to safe methods with no deviation.**
- **Rate progress by frequent audits of conditions in the plant.**
- **Do not let the safety record alone dictate safety policy.**
- **Refrain from activities that set safety apart from doing business.**

big jamboree on election night. The next day, the tumult has died down to a whisper.

Campaigns are short-lived. They very seldom bring about any lasting effects. In fact, nothing about them is intended to be that way. A campaign is fine for getting people all keyed up to do one specific thing. Then it's all over.

BRINGING SAFETY TO LIFE

If safety records fall short as safety incentives and safety contests and campaigns are not what they are cracked up to be, just how do you bring safety to life in your plant or business?

This question has been pondered for years by men in the safety field and they have reached some very definite conclusions about the matter.

Safety leaders are beginning to see the logic in weaving basic safety philosophy into the thinking of all members of management. They have come to realize that their programs will be more effective in the prevention of accidents when safety is included in the plans for doing business.

Safety is brought to life when the daily routine of plant operation is supported by facilities and policies enhancing safety. On this basis, the complexity of accident prevention becomes a well distributed and clearly defined part of each supervisor's job assignment and is no longer a "hodge-podge" of questionable responsibility.

All supervisors will readily accept standards for housekeeping, production rates, product quality and the like. They will accept as unquestionably standards for safety once they are established and made known to them.

FOLLOW MASTER PLAN

Supervisors in industry are accustomed to working according to a master plan and once their safety jobs become a part of this plan, there is a minimum of misunderstandings.

Safety engineers should recognize the advantages in this approach because the sooner their programs become a part of the total program of their plants, the sooner they will see the safety program produce results.

It is my opinion that a safety engineer should do everything possible to prevent the safety program from becoming set apart from other undertakings in the plant. If he permits safety to become a gimmick with lots of ballyhoo and no dignity, he has divorced his program from the master plan for doing business in his plant and neither he nor his program remain a part of plant operation.

A safety engineer cannot expect his program to become a part of routine plant operation unless he himself directs his efforts toward that objective. I do not believe an edict from top management in itself is sufficient to bring into being such a status for the safety program. However, such a stand by top management is certainly necessary as a starting point.

CLIMATE OF SAFETY

Even with this declaration of interest by plant management, the safety engineer must take the lead in bringing about a climate of safety in his plant.

I have used quite freely the phrase "making safety a part of doing business." To clear up any misunderstandings concerning what is meant by the phrase, let me explain some of the activity and philosophy in this approach.

If safety is to be a part of doing business, there must be a system for rating both progress and backsliding. This is customary in all the other phases of doing business. Safety records fall short in this respect for reasons previously mentioned.

In some plants, foremen are rated according to how well they have safety under control in prescribed geographical areas over which they are the supervisor. Each foreman is responsible for all that

exists or takes place in his area. When outsiders violate safety policies in a foreman's area, he must assume the responsibility for taking the initial steps in correcting such unsafe behavior. When unsafe conditions develop in his area, he is basically responsible for the condition and must first recognize it and then originate orders for its correction.

Frequent floor checks are made by the safety engineer accompanied by the foreman's immediate supervisor to see that all is well. If all is not well, the foreman is held responsible and rated accordingly. The foreman is not beat over the back with the safety record because he neither understands it nor can he do anything in particular about it. Instead, his attention and responsibility is directed at the accident that might occur tomorrow by rating him on the control of accident potential in his department.

ESTABLISHED SAFETY STANDARDS

To use such a system of rating foremen, it is necessary that safety standards be established for guarding, machine controls, employe behavior, truck operation, lighting, ventilation, housekeeping, fire prevention, and many others. The safety engineer must fulfill the responsibility of clearly stating the safety standards so that misapprehension will not cause confusion.

Safety standards must be written to fit into the general operating pattern of the plant and must be short and to the point so there can be no misunderstanding as to their intended purpose. Standards for guarding and machine control arrangements must be tailored to fit the particular hazard problem in the area where they are to be used.

In short, the objectives and the ground rules to meet these objectives must make sense to the operating supervisors and the employes as well.

Production standards must be established at a time when the machines are being run according to the safety standards with all guards in place and all safety devices in use. Facilities must be provided to make safety possible and supervisors must insist that these facilities are properly used and maintained in good serviceable condition.

AN OPERATIONAL FUNCTION

There is nothing more easily recognized in a safety program than procrastination. If safety is to be a part of doing business, it must be given the same attention as other problems in plant operation. When safety becomes an operational function, it takes on a complete new quality in the minds of both the foremen and the employes. Such a change in status is partially due to the improved thought pattern of all concerned.

Safety can be expanded to any desired degree, providing the people involved want it that way. Once it is decided that the whole operation of the plant will be performed safely, there can be no neutral zone. Either it is safe and according to the plan or it is unsafe and strictly taboo.

Many questions and differences of opinion which are bound to arise will concern the use of guards and other mechanical safety devices. When decisions are made in these cases, there should be no unreasonable delay in either the provision of the safety devices or the insistence by management that the devices be continuously used.

INDICATION OF INSINCERITY

Delay or indecision in the safety program is rightfully considered by employes as an indication of insincerity and should not be tolerated. Employes cannot be expected to get behind the program unless their immediate supervisors are consistently asking them for safe performance and are holding them responsible for coming across. Likewise, the employes expect management to come across with good positive leadership in the safety problem.

To make safety a part of doing business, there are seven important steps to be taken:

- Establish definite plant safety standards.
- Plan safety into each job and provide facilities.
- Clearly outline each employe's safety responsibility.
- Supervise according to safe methods with no deviation.
- Rate progress by frequent audits of conditions in the plant.
- Do not let the safety record alone dictate safety policy.
- Refrain from activities that set safety apart from doing business.

Each of these steps is important. None of them can be slighted without a decided general disadvantage.

GREATER EFFORT FOR SAFETY

When this approach to the accident prevention problem is used, it will be quickly realized that all concerned, management and employes alike, are much more receptive to the work, discipline and order so essential in such an undertaking.

The safety program designed and administered to blend and function with the operating objectives of the business will be successful. I have yet to see a safety program succeed where the emphasis was placed on gimmicks, contests and safety records.

On the other hand, we are all engaged in businesses or industries which thrive on competition. We have become experts at doing business in spite of the challenges of free enterprise. I for one will cast my lot with the operating team in my plant. They have proven to me that they know their jobs and are capable of furnishing the direct leadership my safety program needs. My part of the job will be to serve as administrator, coordinator and advisor but safety will not suffer in my plant. It will be enhanced because my objective at every turn of the road, will be to "make safety a part of doing business."

SAFE PRACTICE GUIDE

FOR

Zirconium, Zircaloy and Hafnium

by William W. Allison

This paper directs attention to the fire and explosion hazards associated with zirconium, its alloys, and hafnium, and emphasizes the measures that should be employed to prevent the occurrence of such hazards. The recommendations and requirements presented are based on conclusions drawn from available reports or data and from actual experience acquired in working with these metals over the years.

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THE STORAGE, handling, shipping and processing of zirconium and its alloys are hazardous if proper precautions and safeguards are not employed. Hereafter, the Zr. for the word zirconium is intended to include the Zircaloys. As Mg, Ti, and Al, Zr. under certain circumstances is highly flammable and explosive. Both hazards are related to the surface area-mass relationship.

The very finely divided powder form is explosive, whereas, such forms as coarse turnings are oxidized only at high temperatures *(see Appendix I)*. A number of tests have been directed toward determining the hazards. The results of these tests and the experience acquired over the years are employed in this paper to outline methods for the safe handling of Zr.

There have been very violent fires of moist or wet Zr. scrap in the form of machine cuttings and fines *(Ref. 1)*. However, no detonations have been encountered in their machining, handling, or storage —as have occasionally occurred in the production, handling, and storage of powders. Moist or wet Zr. scrap results from the large production operations where water coolants are used. In laboratory operations where water-base oils are not used, the dry scrap burns quietly at white heat.

Limited tests with hafnium indicate that it is somewhat less hazardous than zirconium, so that the same general safe practices provide good safeguards. One exception is the sponge form of hafnium which is more hazardous than Zr. sponge.

Many plants throughout the U.S. now produce or use zirconium, and tons of zirconium have been safely machined and processed. However, during the years some serious explosions have occurred with various powder forms.

Explosions have occurred following acid treatment of several pyrophoric metals in massive forms; and surface explosions can probably occur under the "right" conditions with acid treatment of any pyrophoric metal. Hot rolling of steel-clad Zr. can result in squeezing a molten spray of burning Zr. out of the cladding if the proper temperature controls are not maintained to prevent melting the eutectic formed at high temperatures.

Violent steam and molten metal explosions can occur in vacuum arc melting. Zr. powders compressed into what appear to be solid pieces retain their pyrophoric powder characteristics until their density approaches that of the solid wrought form of the metal.

However, there is no evidence that any massive solid particles or pieces of solid Zr. have ever exploded in machining, welding, heat treating, rolling, melting, etc. (The term solid refers to ingots or crystal bar, as opposed to non-solid forms, such as sponge and powder compacts.)

The violent explosions, which have occurred and resulted in fatal injuries, have all involved powders finer than 62 microns, or finer than 230-mesh size. Pieces over 0.005 in. thick and wider than 1/16 in. will not burn when exposed to ordinary flame or fires. Pieces finer than this will burn with an intense white heat and can be readily ignited with a match flame.

Obviously, if pieces thicker than 0.005 in. by 0.0625 in. wide will not continue to glow or burn after a flame is removed, the same precautions are not warranted for all forms of Zr. provided the finer forms are not allowed to come in contact with the coarser material. However, due to its intense white heat, a large handful of fine Zr. when ignited in close contact with coarse turnings, can cause the coarse material to ignite and sustain combustion itself.

The clean, dry Zr. fine scrap will normally burn very quietly with an intense white flame. If the same fine scrap is moist, it will burn very violently and will even throw the burning scrap out of a container. Zr. at white heat, in the presence of moisture, reacts with water to form hydrogen and oxygen. If the amount of water greatly exceeds the mass of zirconium, the water cools and stops the burning. However, the recommended extinguishing medium is the G-1 powder (dry graphite), or the Metal-X (sodium chloride). These are commercially available and should be applied with scoops.

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MACHINING, PICKLING, AND SCRAP HANDLING

The safe practices in machining are simply to use liberal amounts of coolant such as air, water, oil, or water-base emulsions. Where air can be used it results in dry and therefore less flammable scrap.

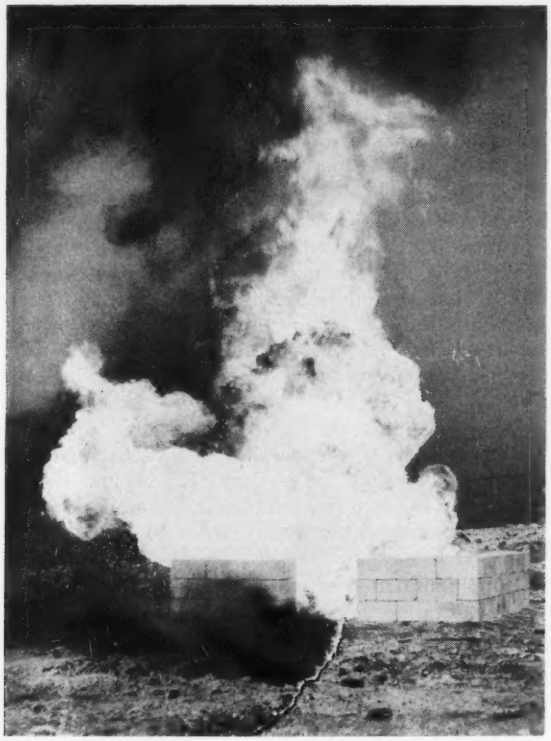
Cutting tools must be kept sharp. If, for any reason, it is impossible to use coolants on machines used to cut Zr., slow feeds and cutting speeds must be used to prevent the generation of enough heat to ignite turnings, filings, borings, or chips. Only small amounts of turnings, filings, borings, chips, or sawdust should be allowed to collect on a machine before removal.

Upon removal, the scrap should be placed in an appropriately labeled galvanized steel container which must be kept covered at all times and should be placed a safe distance from the machine and from any source of heat, such as sparks or open flames.

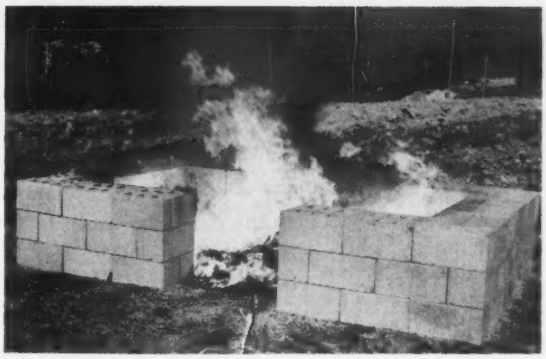
When Zr. is beltsanded, the fines must be kept wet to prevent flashing of any unoxidized particles. The machine must be thoroughly washed down before and after each use, since even the motion of the belt in starting up can cause the dry fines to flash.

Scrap material finer than 20 mesh and coarser than 120 mesh should be collected wet (under water), mixed half and half with sand or grinding wheel grit, and placed in 1-lb polyethylene screw-cap containers. The amount of water must always be sufficient to cover the Zr. and the container must be tightly capped. The amount of water should always be more than 25% of the total content of the container.

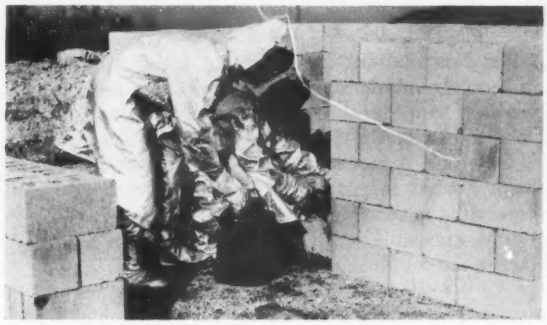
The use of nitric acid or aqua regia on pyrophoric metals can cause metal surface explosions. Operators must wear complete face and body protection



● FIGURE 1. Overloaded Burning facility in which approximately 300 pounds of Zirconium were burned. A large quantity such as this tends to burn with considerable violence if it is damp or wet.



● FIGURE 2. Safe Burning of 60 pounds of Zirconium scrap in an enclosure built with cinder blocks and a steel plate over the ground.



● FIGURE 3. Required protective clothing used in burning Zirconium scrap turnings includes a face shield, asbestos gloves, and aluminum coated asbestos suits.

against acid splash from such surface explosions. Aqua regia should not be used for pickling.

The prevention of some metal surface explosions in nitric acid pickling is accomplished by maintaining a minimum molar ratio of fluoride-to-metal of four to one. Ths is equivalent to one gram of fluoride to one gram of Zr. The fluoride may be added in the form of 30 grams of ammonium fluoride per liter of a 50% nitric—50% water solution; or a minimum of 3.5 to 10% hydrofluoric acid by volume (or 50% by weight) in a 45% nitric/5% water solution.

Scrap Zr. should be removed from the shop area daily, weighed, tagged, and labeled with the proper warning label according to its size. If the scrap is to be stored, the storage area should be away from all buildings and all sources of heat.

Fine turnings must be stored under water. Containers must have sufficient water (the zirconium should be totally submerged) and be leakproof, and the area must be free from all other flammable materials.

As noted, the very coarse turnings can safely be stored dry in tightly covered heavy steel drums. However, if there are any fine chips, fine lathe turnings, or fine milling machine cuttings, the only safe storage is under water—preferably in a rust resistant, heavy gage steel drum with a tightly secured lid.

DISPOSAL BY BURNING

The daily burning of fine turnings of Zr. scrap is recommended, where practical, in order to eliminate fire hazards in the further storage and handling of the scrap. However, certain preparations and precautions can be suggested from the tests and experience of Bettis Laboratory. First, only small batches of 50 to 75 lb. of scrap should be burned at any one time. As can be seen in *Figure 1*, in which approximately 300 lb. of Zr. were burned, a large quantity tends to burn with considerable violence if it is damp or wet.

Two simple burning facilities are shown in *Figures 2 and 3*. They are enclosures built with cinder blocks and a steel plate over the ground. The primary advantage of burning small quantities at any one time is that it makes the fire relatively easy to control, and also makes it easier to rake the material to assure complete oxidation.

A large fire is not only an immediate fire hazard to surrounding areas, but the mass of material will continue to oxidize for as long as three days and possibly form large clinkers which are not completely oxidized. With a small quantity of scrap, it is easy to stir the fire with a 10-ft-long steel-handled rake to ensure that the zirconium is completely oxidized.

A safe quantity of scrap, about 6 to 10 inches deep spread over the surface of the burning facility, is indicated in *Figure 2*. About 50 square feet of burning area per 60 lb. of scrap turnings spread out about 6 in. deep could be a rough rule of thumb.

Due to the tendency of the damp Zr. scrap to fly out of the pit when first ignited, it is necessary to ignite the fire by remote control. A gas line with a spark igniter or slow burning igniter cord provides a safe method. Usually some kerosene must be poured on the Zr. to assure ignition. An FM-approved safety can and neoprene long gauntlet gloves must be worn while pouring kerosene. The gloves must then be removed and replaced by aluminized asbestos, long gauntlet gloves.

Powder may be mixed in an alcohol slurry by adding alcohol to a quart poly bottle half full of powder. Tumble thoroughly. Spill out and spread on 18 inch square tray and ignite with a torch on a 20 foot pole. A face shield, asbestos gloves, and aluminum coated asbestos suits should be worn. *(See Figure 3.)*

POWDERS

Medium, −125 to +53 micron powders can ignite and burn or explode readily from exposure to flame or red hot surfaces. Fine, −53 micron powders can ignite and burn or explode readily form exposure to static sparks created by moving powder over paper or other non-conductive materials, by the static discharge from the human body, by electric arcing of motors, or a hot filament.

The very limited tests reported to date have only demonstrated that −10 micron powders will ignite with minimum spark energies of about one microjoule, but the many unexplained explosions of apparently coarser powders indicate that a small percentage of fines can act as a fuse to involve coarser powders in explosions.

To prevent ignition and explosions, fine powders must be kept under an inert argon atmosphere.* Quantities must be kept to the lowest maximum amount possible. Dry boxes for opening, pouring, transferring, mixing, and processing must maintain 98 to 100% argon atmosphere.

If more than one pound is open at any time, then the dry box must be equipped with continuous ½ of 1% oxygen alarm monitors to prevent buildup of oxygen, which quickly defeats the protective shield of argon by allowing contact of oxygen in the air with the fine highly pyrophoric powders. As little as 3% oxygen in an inert atmosphere is required to obtain ignition of fine powder by electric sparks. Only explosion-proof electrical fixtures and equipment can be used in contact with pyrophoric powders.

**Danger Note: Do not breathe argon or other inert atmospheres. 18% 0_2 is required to sustain life. Do not place head in dry-box.*

Although ideal explosive conditions require dispersion of powder in air, one cannot assume that a pile or layer of powder will not explode. The disturbance of a little powder can readily result in a small mild explosion which disturbs a pile or layers of powder, and causes a second and very severe explosion.

An air lock is required to permit insertion and removal of material without introducing air. A dry box must not be opened to the atmosphere or oxygen at any time that zirconium powders are within the box. Two oxygen detectors will monitor the internal argon atmosphere. At any time that the oxygen content exceeds ½%, all powder operations must be stopped and efforts made to seal the zirconium containers.

Before opening the box for cleaning, all loose powders should be recovered with a vacuum cleaner introduced through the air lock. The cleaner should be allowed to run a few minutes in the air-lock argon before cleanup of powder in order to flush air out of the cleaner.

Upon completion of work within a box, all zirconium should be covered and the glove ports should be sealed. If a glove is torn during operations, that port should be immediately sealed. When gloves are not actually in use, their ports should be sealed.

Operating personnel, including the engineers involved, must be thoroughly trained by means of fully "dry-run" operations, and detailed operating instructions must be posted for each specific operation involving fine pyrophoric powders.

Both safety goggles and a wire and plastic face shield with an aluminized snood must be worn in powder operations at all times. Aluminized asbestos or welder's flame-retardant clothing should also be worn.

No smoking, flames, electric arcs, flammables, or oridizing agents should be permitted in the powder areas. Clothes and equipment must be carefully vacuumed with an approved explosion-proof vacuum cleaner before leaving the area and at the end of each day. Rags should be vacuumed and then burned daily. No not launder unless thoroughly vacuumed.

The safety of personnel requires the use of the AC-1730 Poly Bottle inside a fine powder, heavy-wall safety container within a metal drum packed with a non-flammable shock absorbant material. The powder must be shipped, handled, stored and delivered to the Powder Facility in this safety container, as described above, only in the quantities used per eight-hour day (See SHIPPING REQUIREMENTS).

FIRE CONTROL

The greatest deterrent to fire is to keep Zr. under a 98% or more atmosphere of argon or helium. The next best deterrent is to keep Zr. under 50% water by volume in a heavy wall soft polyethylene container.

There has been some investigation into the behavior of Zr. fires when water is introduced as the controlling medium. The general consensus drawn

from these limited tests indicate that the discharge of water from spray or fog-type sprinklers will help protect surrounding areas without causing any serious explosive hazards. A direct, solid steam, however, can spread the fire and cause a violent reaction and should be avoided.

Other fire-extinguishing agents such as carbon dioxide, foam, and sodium bicarbonate base dry powders are ineffective on Zr. fires. Carbon tetrachloride must never be used as it reacts explosively.

Within a closed container, Zr. fires can sometimes be extinguished with helium or argon in sufficient quantity. At the same time the outside of the container can be cooled with water spray.

Air must be completely excluded until the burning mass is cooled to room temperature. One or two handfuls of scrap can be allowed to burn itself out. For larger quantities, the use of G-1 powder (or dry graphite) is recommended. It should be applied by the use of shovels or scoops, not by extinguishers.

SHIPPING REQUIREMENTS

Unless more stringent regulations are issued by others, the following safe practices should be followed to assure safe shipment of common, private, or government carrier:

1a) *Solid Zr., Zircaloy, and Hafnium—billets, ingots, forgings, etc.* Ship in packages, boxes, on skids, or loose. Individual articles or packages must show gross and net weights.

1b) *Solid Zirconium, Zicaloy, and Hafnium—strip, tubing, sheets, and finished parts.* Package shipment in wooden containers to prevent damage in transit from rough handling and possible loss. Each package must show gross and net weights.

1c) *Zirconium, Zircaloy, and Hafnium—scrap, plate edge trim, pellets, etc. (Smallest dimension over 1/16 in.).* Place in metal container of up to 30 gallon capacity, consistent with the quantity of material to be shipped. Water is not necessary, and no warning label is required. Show gross and net weights of each container. In those rare cases where zirconium, zircaloy, and hafnium scrap, turnings, and chips with smallest dimension over 1/16 in. is produced dry and never exposed to rain, snow, condensate, steam, or water in any form, it may also be shipped dry in tightly sealed drums (17H-type) of up to 30 gallon capacity.

2) *Zirconium, Zircaloy, and Hafnium — scrap turnings, and chips which have either been generated from wet machine operations or exposed to moisture at anytime.* Place material in 30-gallon, 17H-type open head steel drums *(see page 238 of Ref. 2)*, cover contents with water, and place a gasketed and securely fastened lid thereon to prevent leaking in transit. Steel drums should be labeled "This Side Up," indicating that the shipment must be made in an upright position. A yellow warning label for flammable solid and oxidizing materials must be applied to each container *(see Ref. 2)*. Show gross, net, and tare weights of each container.

3) *Zirconium, Zircaloy, and Hafnium sponge or powder coarser than 20-mesh particle size.* When possible, use no larger than a 3-gallon metal container of not less than 20 gage. Never exceed 30-gallon, 17H-type, open head steel drums; capacity should be consistent with the quantity of material to be shipped. Water is not necessary, and no warning label is required. Show gross and net weights of each container.

4) *Zirconium, Hafnium, and Zircaloy powder, coarser than 120 mesh but finer than 20 mesh (—840 to +125 Micron Size).* Place in an inside, 18-gage or thicker, metal container or heavy duty polyethylene screw-cap bottle of up to 1-gallon size. The metal container must be secured by positive means. The outside container must be ICC Spec., 18 gage or thicker, when the inside container is metal, or 14 gage or thicker when the inside container is polyethylene. The inside container shall be completely surrounded by not less than six inches of non-combustible cushioning material.

5) *Medium Powder finer than 120 mesh and coarser than 270 mesh (—125 to +53 microns).* Package in units of not over ten-pound-net, heavy polyethylene bottles with heavy duty polyethylene screw caps (AC-1730-type). Either fill with 50% water by volume or flush with dry argon or helium; then back-fill with argon, screw cap tightly in place, and seal. Fill cans to the top to avoid excess movement and exclude air. The polyethylene bottle must be enclosed in a metal container which, in turn, must be placed within an outside-specification metal drum.

A non-combustible type of cushioning, capable of absorbing the entire liquid contents of the package (or a total minimum of four inches thick in all directions for dry shipments), must be placed between the polyethylene bottle and the inner metal container and also between the inner metal container and the outside-specification drum. In those instances where water will introduce nonpermissible impurities into the powder, the argon or helium inert dry gas method should be used.

Net weight must not exceed 40 lb and the gross weight of the entire package must not exceed 75 lb. Apply a yellow label for flammable solids. Both inner and outer containers must show mesh size, atmosphere, date packed, and origin (vendor).

6) *Fine Powder finer than 270 mesh or —53 micron size.* Package in units not to exceed

five-pounds net in thick-wall, dense, static-resistant (but non-carbon) polyethylene bottles with heavy-duty screw type polyethylene caps with no less than three continuous threads (AC-1730 type). Either fill with 50% water by volume, or flush with dry argon or dry helium, and then back-fill with argon; screw cap tightly in place and seal. Fill bottles to the top to avoid excess movement and exclude air.

Remove any powder from exterior surface of bottle. The polyethylene bottle must be enclosed in a heavy-duty metal safety container with ¼-inch wall thickness such as can readily be made from two four-inch steel or malleable iron flat head caps and a seven-inch seamless galvanized standard steel pipe nipple. This special fine powder container must be enclosed in an outside-specification drum.

A non-combustible type of cushioning must be packed between the heavy-duty safety container and the outside-specification drum to provide a minimum of six inches of cushioning material in every direction between the inner safety container and the outer ICC specification steel drum.

No less than a 30-gallon drum shall be used for the maximum permissible net content of four 5-lb* safety-container-enclosed units; or no less than a 16-gallon drum for a net content of two 5-lb,* safety-container-enclosed units; or no less than a 10-gallon drum for a net of one 5-lb* safety-enclosed unit. Yellow labels for flammable solids must be used on the outer drum, which must be painted yellow. Inside safety containers must show mesh size, net weight, date of packing, inert atmosphere, and source of origin.

MISCELLANEOUS

All waste, rags, and burnable containers which have been in contact with the finer forms (powder) of Zr. should be put in separate, appropriately labeled waste cans immersed in water containing a good wetting agent, and placed in the holding areas. These items will be delivered to the incinerator at regular intervals. The firemen should be instructed to fire these into a hot fire immediately. To avoid the possibility of a flare-back, only small quantities should be fired at one time.

Burning and welding must never be permitted in an area where there is a possibility that a flame or spark will ignite Zr. Before such operations are performed, the welder must obtain a permit from the department foreman, whose duty it will be to inspect the surrounding area for possible hazards. If such hazards do exist, they must be removed. Welding department supervisors should instruct welders that permits must be obtained, and inform them of the flammable and explosive nature of Zr.

Because of the explosive nature of Zr. powder, all chance of dust cloud or layer formation and all possible sources of ignition should be eliminated in dust-susceptible areas *(Ref. 3)*. Dust-producing equipment should be dust-tight; dust accumulations on ledges, beams, floors, and other exposed surfaces should be removed periodically.

Electrical equipment and wiring should conform to the requirements of the National Electrical Code for hazardous and dusty locations. All open flames and smoking be prohibited in affected areas. Repair work requiring the use of torches and welding equipment should be performed only during shut-downs after removal of all dust.

Bearings and other moving parts of machines should be dust-tight and in good working order to prevent overheating. All dust-processing equipment should be properly grounded to prevent accumulation of static charges. Where possible, only non-sparking tools should be used.

Where possible, equipment and rooms in which a potential explosion hazard exists should be provided with relief vents through which the pressure of an incipient dust explosion can be released quickly.

Since it is more difficult to ignite, finely powdered Zr. with a sufficient amount of water is much safer to handle than dry Zr. powder *(Refs. 4 and 5)*. It has been recommended that the water content be 25% or higher. Zr. powder containing up to 5% water burns in about the same manner as dry powder. When the water content is between 5 and 10%, the powder burns much more violently than the dry powder and is apt to explode.

A little water on hot or burning Zr. adds considerably to the hazard. Zr., as an oxygen getter, takes oxygen from the water and frees the hydrogen as a highly explosive gas. Hence, the violence of moist scrap fires as opposed to the quiet incandescent glow of a fire involving dry Zr. scrap turnings, fines, and coarse powders. However, if there is more water than there is Zr., there can be no fire.

Thousands of pounds of scrap in fine as well as coarser forms has been stored under water for periods of up to two years outdoors. Freezing and thawing occurred over many months. There never was any evidence of any hydrogen forming as a result of this prolonged contact with water; no fires, temperature increases, or incidents of any kind occurred.

The explosion hazard of zirconium is of particular concern where water can come into contact in a confined volume with large masses of molten Zr. as it can in a burn-through in melting furnaces and similar equipment. The resultant reactions can cause a very violent and destructive explosion.

The eutectic properties of Zr. with other metals were described recently *(Ref. 6)*. Several explosions have occurred because these properties were not fully appreciated. For example, the rolling of steel-clad zirconium must never be done at temperatures over 1650°F, since the eutectic between iron and Zr.

**If dry and under argon atmosphere, inner container may hold up to 5-9/10 lb. of powder.*

occurs at 1710°F and there is danger that the steel-clad will rupture.

Extremely thin pieces of Zr., such as foil *(Ref. 7)*, must not be etched in carbon brick or steel tanks because of possible explosion from galvanic action. Plastic tanks should be used to prevent such hazards.

ZIRCONIUM POWDER COMPACT EXPLOSION

Zirconium powder was compacted under high pressure (50 tons) into small compacts about ⅜ x 1½ in. in size. These compacts were placed in the center of several solid bars of zircaloy. The bars were tightly clamped together and tack welded to form a furnace electrode.

Apparently, the heat of welding eventually reached the compacts which exploded with considerable noise and a brilliant white flash observed as far as 75 feet away in daylight. The compacts were completely oxidized in the explosion.

The usual heliarc method of welding was used and, after 8 or 10 tack welds, the electrode exploded. Partially because of protection afforded by the welding hood, asbestos gloves, and flame resistant lab coat, and partially because the force was directed away from the welder, there were no injuries.

In an investigation following the explosion, identical Zr. compacts were subjected to heat and flame. These compacts were good solid compacts with a smooth surface resembling a solid piece of metal with roughly the strength of a piece of hardwood. When subjected to a match flame, however, they behaved in a manner very similar to loose powder —and flashed and exploded, scattering white burning metal or agglomerates of powder which oxidized completely within a few seconds.

When placed on a thin stainless steel plate, they again flashed and scattered flaming pieces as soon as a low bunsen burner flame was placed under the plate. However, when placed on a hot plate at 400°F and heated for four hours, they did not flash, burn, or explode. Instead, the compacts slowly oxidized and subsequently could not be ignited. If an oxide film were not objectionable, this would be a possible means of passivating the powder.

Apparently, the use of these Zr. powder compacts in electrodes introduces the possibility of an explosion: (1) in case air or oxygen is inadvertently present or introduced in the melting furnace atmosphere, and (2) during the fabrication welding of the electrode. One other electrode was made and used without incident in a four-inch arc furnace under an argon atmosphere at slightly below atmospheric pressure.

Subsequent experiments with sintered compacts resulted in a practically non-combustible compact and those compacted to a density of 80% or more would only burn when subjected to extremely high temperature.

ZIRCONIUM-URANIUM ALLOY

Several laboratories have reported explosions during the pickling and etching of zirconium-uranium alloys. An investigation into the cause of this phenomenon was carried out at Argonne National Laboratory *(Ref. 8)*. Findings revealed that zirconium-uranium alloys containing from 1 to 50 w/o zirconium do not dissolve cleanly in nitric acid, but leave a zirconium-uranium epsilon phase residue, insoluble in nitric acid. Depending upon the composition, homogeneity, and previous thermal history, such alloys contain lesser or greater fractions of finely divided epsilon phase in a matrix of alpha uranium.

On treatment with nitric acid, the matrix is rapidly dissolved and the epsilon phase is slowly oxidized. In the course of, or subsequent to, such acid treatment of the unoxidized particles, the epsilon phase may undergo a rapid oxidization with explosive violence.

The addition of fluoride ion increases the rate of solution of the residue and prevents the formation of an explosive surface coating. Alloys containing 2, 4, 10, and 20% Zr. have been satisfactorily pickled in a solution of 12-M nitric acid and 1.0-M hydrofluoric acid at 50 and 75°C. Additions of fluoride should be made to replenish the fluoride lost during the pickling process.

Goggles, face shields, and protective clothing should always be used when zirconium-uranium alloys are being pickled or etched. Any new process involving new alloys or methods of pickling should always be tested on a small scale to determine whether the explosive coating might form.

A careful visual inspection should be made, and the specimen should be tested by rubbing or striking it after careful drying. This test cannot be considered as conclusive proof that the surface is free of explosive material, since there have been instances in which samples failed to burn when tested but exploded violently when placed in a nitric acid bath.

Such samples should be handled carefully. If any coating is present, the sample should be immersed in water to which a small amount of hydrofluoric acid has been added to remove the coating.

ZIRCONIUM CHUNKLET AND SPONGE FLAMMABILITY TESTS*

Tests were conducted to determine the flammable characteristics of the relatively dense solid mass of Zr. in so-called chunklets (formed from melted sponge) and the relatively non-solid Zr. as it is produced in the form of sponge.

These tests indicated that the chunklets do not present any fire hazard, even when exposed to flame or to adjacent cans of burning sponge.

Individual chunklets will burn if exposed to white hot sponge, but the configuration of the chunklets apparently allows the heat to be dissipated too rapidly to sustain ignition, and the burning does not extend to other chunklets. Sustained burning of any quantity of chunklets would require sustained intimate contact with extremely high temperatures such

**See Appendix II for details of the test results.*

as those produced by the burning of damp fine turnings. The sponge sustains this white hot heat only for a matter of about 15 seconds and then quickly subsides to an orange glow because its mass greatly exceeds its surface area.

The 1% of fines found to exist in the chunklets did not present any problem with the chunklets in the "as-received" packages,** since they tend to be captured inside individual chunklets and do not settle out. The unmelted sponge which exists as a partially compacted mass in about 1% of the chunklets will readily ignite and burn, but the burning will not carry over to the adjacent chunklets.

The sponge presents a fire hazard because it can be ignited within as little as five seconds from exposure to a small flame, and this ignition can spread rapidly over the entire quantity of sponge and even from one thin metal container to another. Because the ease and speed of ignition is greatly accelerated by the presence of any moisture in the sponge, every precaution should be taken to keep sponge perfectly dry and away from any open flame and flammable materials. Shipment of Zr. sponge has resulted in no fire loss when packed in *extra heavy steel drums.*

APPENDIX I: EXPERIMENTAL DATA ON ZIRCONIUM POWDER AND MACHINE SCRAP

Any combustible solid material in finely divided form can produce a dust explosion if dispersed into the air and ignited *(Ref. 9)*. Some combustibles are more readily susceptible to explosion than others; zirconium powder is highly ignitible and explosive.

Zirconium is the most easily ignitible dust. This is true not only for dust clouds but also for settled dust layers. Zirconium can be ignited by a weaker electric spark than any other powder tested and, when dispersed as a dust cloud in air at ordinary temperatures, can ignite from its own static charge. It is classified as a powder of high explosibility along with Mg, Al, Ti, and certain Mg-Ti alloys.

The results of tests conducted on seven different samples of Zr. powder indicated that 20°C and 210°C respectively are the ignition temperatures for dust clouds and dust layers with mean particle sizes of 44 microns. They present severe explosion hazards. The minimum energies required for ignition indicate that dry handling in air can cause a serious hazard since, under some conditions, electrostatic spark energies of the order of 10 millijoules can be built up and discharged by the human body. The data also indicate that CO_2 and N_2 markedly increase the ignition temperatures but do not definitely inhibit ignition.

Hartmann, Nagy, and Jacobson *(Ref. 10)* found that the ignition of dust clouds by electric sparks could be effected with as low as 5% oxygen-helium mixture, 4% oxygen-argon mixture, and 3.3% oxygen-nitrogen mixture. Ignition was produced by electric sparks in pure CO_2, indicating that pure CO_2 does not prevent ignition.

Of two samples tested for maximum pressure developed by explosions within a dust concentration range of 0 to 4 g/ft^3, the maximum pressure was 90 lb/in.^{2}

Ignition energy data indicate that even a 0.01-joule energy static spark, which the human body commonly gives off, is enough to readily ignite powders under 10 microns in size.

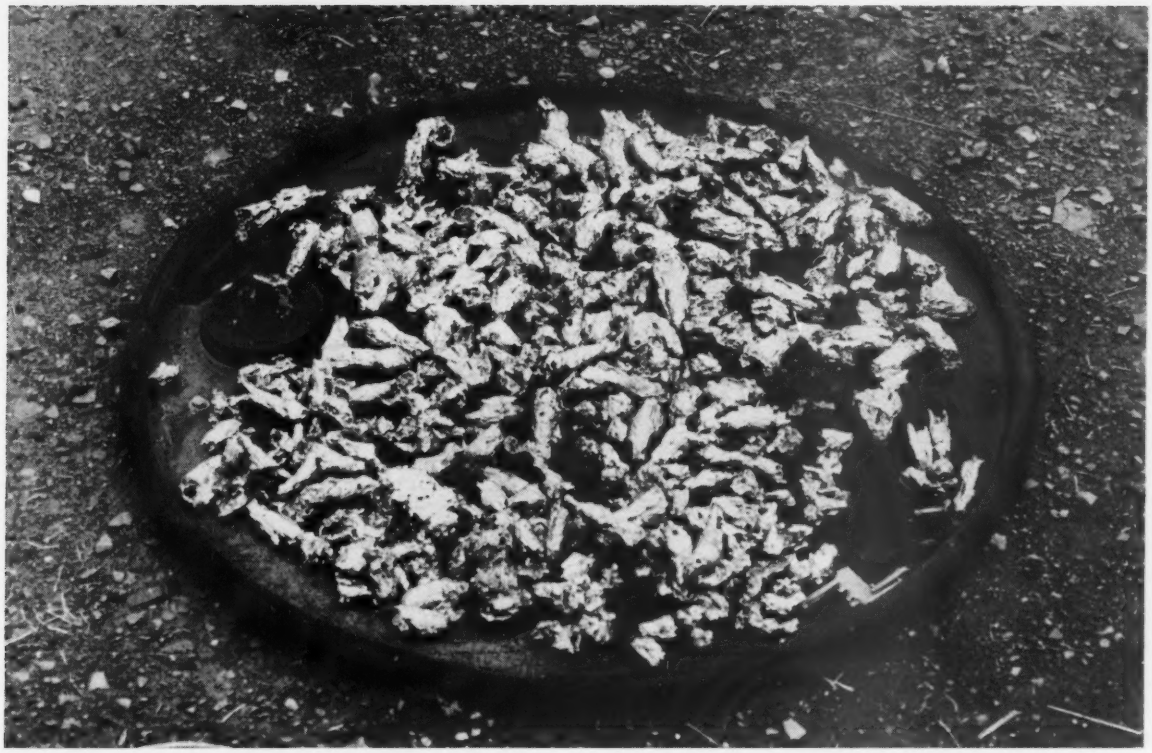
Although violent flash fires have occurred with the cuttings and fines from machining operations, detonations of the type experienced with fine powders and certain former sponge types have not occurred—with the single possible exception of the recent explosion in a pile of 400 to 600 lb of mixed fines produced by underwater grinding of zirconium and fines from grinding stainless steel.

Two blasts or detonations were alleged to occur, with devastating effects. From limited evidence, it is postulated that the water used during grinding might have prevented the burning of the very fine powders which, on approaching the dry or low moisture content state in the pile, could then spontoneously ignite and involve the larger particles. The depth of the pile and *iron oxidation* undoubtedly contributed to heating and ignition of the fines.

The following conclusions were drawn from the results of the tests conducted at Bettis Atomic Power Laboratory:

1) Fine Zr. turnings, chips, or shavings, with smallest dimensions less than 1/64 in., will always burn and continue to burn after a source of ignition is removed. They are readily ignited with a safety match.
2) Coarse Zr. turnings, chips, or shavings, with smallest dimensions over 1/16 in., will glow, but will not burn or continue to glow after the flame of a match or the flame of a gasoline torch is removed.
3) Coarse Zr. metal with ends over ⅛ in x 1/16 in. will glow and melt under a 2500°F flame, but will not glow or burn after the flame is removed.
4) Coarse Zr. machinings over ⅛ in. x 1/16 in. in size will not ignite from a match, bunsen burner, or any ordinary flames; but any quantity over about a half-cupful, when in contact with fine white-hot-burning Zr. will ignite and sustain combustion.
5) Zr. turnings and chips present a fire hazard in quantities of over about one quart, and the intensity of the fire hazard becomes greater with an increase in quantity, a decrease in the size of the end sections of the pieces, and with an increase in relative confinement.
6) Zr. cuttings and fines under water in leakproof containers are generally very safe, even when exposed to fire. Cuttings and fines under oil are safer than those that are dry. (Zirconium stored under water does not produce any measurable hydrogen, thus vents are not required.)

***This 1% of fines is the amount found after washing with water and packaging.*



● FIGURE 4. Zirconium Chunklets shown range in size from ½ to 2 in. During testing the damp chunklets were placed on a pile and ignition was attempted. The chunklets did not ignite or oxidize and retained their original silver metallic lustre.

● FIGURE 5. Two one-gallon cans are shown above. The closed can containing 10 pounds of damp small chunklets was not ignited by the open one containing damp sponge and small chunklets.

● FIGURE 6. Two cans shown after tests. The sponge had burned through the container and fused itself to a spot on one chunklet. The two cans were then fused together.

APPENDIX II: ZIRCONIUM CHUNKLET AND SPONGE TEST RESULTS

The material on the drum lid in *Figure 4* consists of 10 pounds of damp chunklets ranging in size from ½ to 2 in. During testing, this material was placed in a pile and ignition was attempted with a propane torch. The chunklets did not ignite. To show that no oxidation occurred and that the chunklets retained their original silver metallic lustre, they were spread out and photographed.

Figure 5 shows two one-gallon cans. On the left, a closed can containing ten pounds of damp small chunklets (less than ½ in. in size) was placed tightly against an open can of a mixture of damp sponge and small chunklets while it was burning. The sponge burned through its container and into the adjacent can and then fused itself to a spot on one chunklet and fused the two cans together, as shown in *Figure 6*.

Figure 7 shows four closed one-gallon cans, each containing 15 pounds of damp chunklets ranging in size from ½ to 2 in., surrounding and against the open can of 15 pounds of damp sponge, before burning. The sponge burned through its container and into two surrounding cans and fused to these cans. With the lids removed from the surrounding cans, only about 1% of the chunklets were discolored where the sponge had burned against or into the cans of chunklets; the remaining chunklets in the can did not burn or discolor *(See Figure 8)*.

● FIGURE 7. Four one-gallon cans shown before burning. Each can contains 15 pounds of damp chunklets ranging in size from ½ to 2 in., surrounding and against the open can of damp sponge.

● FIGURE 8. After burning, when the lids were removed from the surrounding cans, only about one per cent of the chunklets were discolored where the sponge had burned against or into the cans.

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Safety Engineering

what is it?

by Samuel S. Sharp

In this study no strict cleavage or dividing line between safety engineering and industrial hygiene for improving the well-being of the industrial population is recognized. The truly comprehensive safety program considers every facet of human welfare. Where the various facets are the responsibilities of specialists, activities must be coordinated. Chemists, engineers, nurses, physicians and other scientific and technical personnel must work as a team, each recognizing the professional skill of the other.

It is the conviction of the author that safety engineering, hygiene engineering and preventive medicine should all be integrated into a single team for providing a program of human safety in industry. This program would require a great deal of research and creative activity on the part of each specialist in all areas of human exposure to achieve a safe industrial environment.

SAFETY ENGINEERING is the professional practice which allows manpower to produce products or services necessary in a business, or useful to man, without accident or human injury.

Safety engineering is also the art of applying knowledge and skill in proper design and layout of mechanical-physical facilities. Involved in this is the need to devise proper rules and training for the regulation of human behavior as the means to an end, without accident or human injury.

Finally safety engineering is the science of conducting systematic observations and objective analyses of, as well as experiments with, facilities,

(This article is based upon a talk given by the author to a conference of the Tennessee Valley Section of the American Industrial Hygiene Association at Huntsville, Ala.)

materials, and processes for increasing the understanding of accidents and human injuries so that corrective action may be taken.

If this is a reasonable description of safety engineering, and in my opinion it is, then protecting industrial human resources is not the duty and obligation of *only one man* in an organization nor that of a relatively small group with academic training and professional experience in a few scientific disciplines. It is their responsibility to identify hazards and see that *each* person in the plant is educated to adopt and practice a personal safety program.

A comprehensive program for achieving safety in industrial operations pays big dividends. First, it protects the physical well-being of human resources. Second, it has a salutary effect on employe morale. Third, it helps provide and maintain first quality physical facilities and methods. Fourth, it helps lower the unit cost of producing a product or providing a physical service. In general, it makes a substantial contribution to an organization's productivity.

Prior to 1928, the American Engineering Council set up a committee to study the relationship between safety and production. My interpretation of its findings is that one measure of the safety performance of an enterprise is the extent of the organization's efficiency of productivity.

When an operation is performed properly under the right physical conditions, it is done safely. When an accident or human injury occurs, we find jobs are being done improperly or under improper physical conditions, or both.

SAFETY AND PRODUCTIVITY

If the foregoing statements are true—and to my knowledge they have never been proved otherwise —planning and engineering safe operations is synonymous with planning and engineering efficient productivity. It can be safely said, that a product or service of maximum quality cannot be produced or provided on schedule in optimum quantity at a minimum unit cost under physical conditions and human performance which produce accidents or injury. It follows, therefore, that safe operations have a direct relationship to the quality of research, creative engineering, sound planning, effective employe training and capability of supervision.

Each branch of engineering and science can and does play a significant role in the safety of operations. The engineer or scientist responsible for design, layout and specifications of physical facilities, materials and methods is employed primarily because he has developed specialized knowledge and skill in the physical properties thereof.

The safety engineer, on the other hand, is a "generalist" in his professional practice of engineering and science. He is responsible for developing a general knowledge and skill in relating the physical elements of machines and material to the physiological and psychological elements of employes to prevent accident or injury.

Personnel responsible for developing safe operations should possess three attitudes or attributes:

- They should respect and utilize the knowledge and skill of professional engineers and scientists who practice a discipline related to the problem at hand.
- They should have a general knowledge of operations as a whole, and an idea of how the solution of a problem in one area will affect conditions or operations in another area.
- They should be objective in weighing facts and reaching conclusions in relation to human well-being.

RESPONSIBILITIES OF PERSONNEL

The primary obligation of safety personnel is to be critical or judge with severity (in a constructive sense) plans, design, layout, material or program of operations in order to:

Protect employes by design, location or mechanical guard, from the hazards that may be inherent in the facility or process.

Protect employe health from corrosive or toxic hazards inherent in certain materials or products.

Control dusts, fumes, gases, heat or vapors which may be made or liberated by facility or process.

Control explosive or fire hazards which are inherent in or created by facility, material or process.

Provide for personal protective equipment for employes when removal of hazards because of enclosures, locations, or mechanical guards is not possible or practicable.

Develop rules or standards of human behavior for employe protection from hazards which cannot be eliminated by isolation, mechanical guards or personal protective equipment.

Provide layout of buildings, facilities and process for natural flow of material or product to reduce congestion or debris to a minimum.

Provide sanitary measures for the protection of human health.

Make provisions for the orderly flow and parking of employe riding vehicles.

Investigate causes of accidents and human injury objectively for indicated corrective action.

Develop an employe education and communication program for regulating human behavior, throughout the plant.

Develop a program for the maintenance of physical facilities, human behavior and human well-being, including necessary engineering revision.

In the early days of the safety movement, the question "How can a company afford the cost of a comprehensive safety program?" was often asked. The question today is "How can a company afford to operate without one?" I am not suggesting that recognizing accidents and human injury in executive direction and control is the most important activity of industrial management. However, for influencing productivity in operations and maintaining physical facilities and employe morale, it is second to no other activity.

on the National Scene

PRESIDENT GRIMALDI OUTLINES GOALS: APPOINTS VICE PRESIDENTS, CHAIRMEN

(The following is based upon the talk given by Incoming Society President John V. Grimaldi upon being inducted into office at the Society's Annual Meeting, Monday, October 16.)

The leadership of my many outstanding predecessors has prepared the Society for a new move toward new horizons. We should wait no longer. If we have gained the maturity and character that 50 years of life should have given us, we are ready for bigger tests and greater rewards.

Speaking broadly our aims this year will be:

Increased society growth. Membership development has been proceeding nicely. But, increasing our rosters is not enough. The measure of a Society is its contribution to the profession it represents. In ASSE, its building blocks are the chapters. We should inspire the chapters, by our national example, to discipline themselves and work thoughtfully and wisely towards increasing the quality of their activities. As we grow qualitatively we will also grow quantitatively, for applicants will seek us in order to enjoy the status that such association will bring.

Greater financial security. The Society has managed its income well in the past, but this year a different situation confronts us. We are undertaking new, greater expenses without the financial assistance we once enjoyed from the National Safety Council. Nevertheless, if our plans are successful, the end of the year should see our financial reserve greater than now.

Increased service contribution to the members and the public. One membership service, the JOURNAL, is already underway. All that remains here is for it to be managed so as to cover expenses as soon as possible. In the year ahead the foundation will be laid for further benefits, directly or indirectly, to be received by the members.

Greater Society unity. We shall try to give you an administration which will, through its firmness, practicality and the wisdom we beseech God for, coalesce divergencies and ally our strength. We must mount a concerted effort towards pushing safety into the ranks of other major professions.

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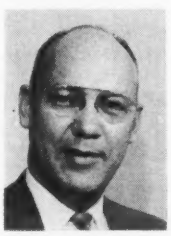
1961-62 REGION VICE PRESIDENTS



POLLARD
Northeast

CHRISTIAN
Eastern

VAN NAMEE
East Central

LOGAN
Southeast

SCHLUETER
Central

DOUGHERTY
West Central

JOHNSON
Southwest

DREYER
Western

This would all be hopeful talk, with little chance for success, if it were not for the capabilities of your Standing Committee Chairmen and Regional Vice Presidents. These associates will implement the action program at the national level.

In planning for the year ahead, I have taken the liberty of applying the organizational advantages provided in the proposed Constitution. The new document prescribes fewer committees by telescoping several of the present ones.

The work will still be covered as broadly as it was, but there is little chance now of overlapping assignments, and chairmen will be able to lead their committees without fear of conflict with another.

COMMITTEE CHAIRMAN

These are your committees and the members who will chair them:

Awards and Honors, Roy G. Benson, Greater Chicago Chapter.

Colleges and Societies, W. Eugene Stuffing, Central New York Chapter.

Finance, Frank E. Laderer, Central Ohio Chapter.

Publications, George W. Harper, Member-at-Large.

Membership Promotion and Public Relations, C. Russell DeReamer, Metropolitan New York Chapter.

Program Planning, E. N. Deck, Eastern New York Chapter.

(A word about this new committee may be appropriate. All the others are recognizable, even though their titles may have been lengthened or shortened. This new standing committee will be concerned with arranging the first annual ASSE conference in 1962. The meeting will be fully professional, topical and concerned with presenting unusual and significant intelligence generally not otherwise available in the literature or at other safety conferences.)

Research, Thomas H. Rockwell, Central Ohio Chapter.

Standards, Laws and Regulations, Robert D. Gidel, Washington Chapter.

These eight working groups constitute our operating components. So that they may have close and immediate contact with an elected officer, who will be relatively free of other Society responsibilities. First Vice President Michael F. Biancardi will assist the standing committees in the planning, organizing, coordinating and measuring of their activities.

Here Are Your New National Committee Heads

STUFFING
Colleges & Societies

BENSON
Awards and Honors

HARPER
Publications

LADERER
Finance

ROCKWELL
Research

DECK
Program Planning

GIDEL
Standards, Laws and Regulations

DEREAMER
Membership Promotion and Public Relations

A characteristic of control organization is the feedback path. The operating units should deliver winning materials. But there must be a return circuit from the user, to control the operator's performance. Our feedback network between the operating committees and their outlets—the chapters—are your Regional Vice Presidents.

NEW VICE PRESIDENTS

In 1961-1962 these officers will be:

Clyde F. Schlueter, *Central Region,* Wisconsin Chapter.

James F. Van Namee, *East Central Region,* Western Pennsylvania Chapter.

Arthur H. Christian, *Eastern Region,* Philadelphia Chapter.

M. C. M. Pollard, *Northeast Region,* Niagara Frontier Chapter.

P. W. Logan, *Southeast Region,* Georgia Chapter.

D. Mark Johnson, *Southwest Region,* Southwest Chapter.

Clinton W. Dreyer, *Western Region,* San Francisco Chapter.

Robert J. Dougherty, *West Central Region,* Colorado Chapter.

Second Vice President Edwin B. Locke will work closely with the Regional Vice Presidents, to assure a strong link between the national Society's activities and those of the chapters—our building blocks.

This in brief pictures our aims for the coming year and reports the organization that will work to make 1961-1962 another milestone in the Society's development. But regardless of the earnestness of your national committees and officers, it will be the vigorous, intellectual and ethical nature of our members' activities and the organizational strength of their chapters which will be responsible for whatever success we may report in October, 1962.

Let us not be afraid of being too ambitious this year. I believe there is no limit to the advances we can make, if we will be alert to the future, plan thoughtfully, discipline our interests and believe in ourselves and God's help.

Holt Named Chairman Of Safety Committee

WASHINGTON, D.C.—Victor Holt, Jr., executive vice president of the Goodyear Tire and Rubber Co., was elected chairman of the board of directors of the Auto Industries Highway Safety Committee at a meeting of the Board September 14 in Detroit.

Mr. Holt succeeds J. B. Wagstaff, recently retired Chrysler Corp. Vice President. He has been a member of AIHSC Board since 1956 and served as Vice Chairman for the past year.

SAFETY ENGINEERING in a *Changing World*

by John V. Grimaldi
President, American Society of Safety Engineers

FIFTY YEARS AGO, a group of specialists met in New York City. These were energetic men with vision, and their small organization—the United Association of Casualty Inspectors—became the American Society of Safety Engineers. Now, in its fiftieth year, the Society may be properly proud of how advanced it is for its age.

In America, where competition weeds out the ineffective so swiftly, mere survival is an achievement in itself. Steady growth, however, represents something special. Any group which approximates a position of eminence must be representative of enterprise, intelligence, energy and character.

CHALLENGE OF THE FUTURE

Today the Society's members are accepted professionals and have international prestige. Tomorrow, our stature will be greater if we meet the changing world's larger challenges and richer opportunities. To do this we must plot a true course, discipline ourselves so that we are not distracted, and appraise our progress critically so that our contributions may have the greatest affect.

Early accident data[1] were not precise, but they probably allow a fair comparison of safety's impact over the years. Until 1907, the accidental death rate consistently increased. In that year a number of industries began corporate safety activities and the rate turned downward.

By 1911, when the national safety movement began, it had steadily dropped by more than 13%. Through 1921, exclusive of motor vehicle accidents, the fatality rate declined another 32%. A total reduction of over 40% in fifteen years.

Then the affect of the new movement seemed to wane. In the 1921-1931 period the improvement was only 9%. By 1941 another 9% reduction was noted. Now the improvement is about 1% per year.

Consistent progress probably should not be criticized, but we can not ignore the hints which seem to point to a reshaping of the character of the accident prevention situation.

For one thing, it is becoming increasingly difficult to accomplish notable reductions in the accident rates. In some businesses the irreducible minimum seems to be quite near. Many have achieved frequency rates at or close to zero for some time.

However, the nation's severe injury totals continue to hold at disturbing levels. Arithmetically, it may be explained that in a large population, even a small percentage represents a sizable number.

PUBLIC WANTS ACTION

But to people of good conscience, even one preventable accident is cause for concern. Certainly the accident problem is not as monstrous as it once was. Nevertheless, we see evidence of some public dissatisfaction with our safety effort. Attempts to implement safety by laws and decrees are an example.

The new Walsh-Healey regulations, for instance, give fresh color to the picture. Their genesis and implicit forcefulness point up a demand for greater safety than the safety professionals apparently have yet provided. This is not a strange situation. Accident prevention, or any social need, will be met by people without the guidance of their professionals when their confidence is not complete.

Usually the recourse is to government where an immediate impact can be delivered. Unfortunately, the long range potential usually is not so favorable. Firm, fair regulations certainly have value, but it is well to reflect that where they appear, their presence implies a failure of individual leadership and that with an increase in public control the private practitioner loses some of his worth.

PROFESSIONAL STATUS

Lately, there has been concern among some of our members over the status and professional nature of our work. This wholesome interest, however, may not be responsive to the demands on safety engineering in a changing world.

The discussion seems to center on whether the profession is essentially engineering, managerial, some combination of these or possibly something else quite different.

One faction hopes for professional engineering registration. Another group believes a license should be sought specifically for the safety specialism. The divergence of opinions is not so important as the apparent failure to identify first the essentials to be satisfied if greater status and professional goals are to be reached.

The obligations of the professional must be recognized and dealt with or else the term "professional" and such accoutrements as licenses will have little significance.

A short walk through any village or a review of the local phone directory will uncover many who hang out professional shingles—some even are licensed—but who, nevertheless, have not yet won approval as "professional men."

Justice Brandeis, in defining a profession, emphasized that the primary goal of the professional is to help others. He pointed out that the professional's worth is a function of his success in achieving that goal. In this portion of the definition, we find the challenge and the basically ethical nature of the professional role.

A professional relationship must always be a personal one. The public trusts its professionals only after it has proved to itself that it may. In short, status is not created automatically by academic degree nor by legislative decree, but more properly by intellectual and practical achievements.

What then should be the nature of so called "safety engineering work"

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1. Death Rate for Selected Causes: 1900-1956, *Historical Statistics of the United States*, U.S. Bureau of the Census, Washington, D.C., 1960, p. 26.

in our changing world? This is only one opinion, but it is carefully considered and so I hope will have definitive value. To begin, let us look quickly at what is taking place today.

Currently, the conventional professional safety approach is concerned mostly with attempting to influence the behavior of people. For example, if I have counted the presentations at this year's Congress correctly, only 25% of the papers are devoted to subjects which may be considered technical.

The great majority deals largely with ways and means for creating a more active public, employe or management interest in safety. Although subjects devoted to improving persuasibility are unquestionably worthwhile, a reviewer of the program might wonder correctly "Is it no longer important to emphasize the technological side of safety—the control of unsafe conditions? Is the safety problem simply a matter of getting people to do right?"

The answer of course is a flat "No!" to each, but between the technological and the sociological aspects of the problem is a curious complex of convictions which complicate the solution. As a result, many of us dash about trying to do everything conceivable to create an aura of safety awareness and an accident free environment.

SPECIALISTS FAILING

The gadfly type of safety specialist may be an extreme case. But I think it is appropriate to say that the usual specialist attack on accidents is concerned mostly with trying to instill the belief that safety is a state of mind. The objective is to prevent the occurrence of any accident and the measures have countenanced data ranging from the standard disabling injury rates to total injury rates and finally to that most nebulous of statistics, "the near miss accident."

This indicates something less than a technological or engineering approach and as I mentioned earlier does not seem to be producing the wanted results. So limitless a scope dilutes the effort available to accomplish immediate needs and as in all idealistic attempts fails to win the confidence of that hard core of society which accomplishes what must be done—the practical men.

When I was a new safety engineer, I filled a request to give a talk at a local trade school. Anxious to preach the Gospel properly, I studied the literature and absorbed the concepts.

After my talk was finished, I followed my audience out of the room and overheard one boy say to another, "Phew, these safety engineers must be afraid of everything."

I did not mean that at all, but this is precisely the impression given it seems when we try to express a concept that is concerned with, shall we say, "total safety." Certainly the timeless objective should be the elimination of accidents, but this is so ideal that in truth it is impossible.

PEOPLE WILL HAVE ACCIDENTS

We must admit that people, from time to time, will have accidents. It does not seem possible even in this changing world to find eventually a way of controlling behavior so that momentary lapses can be eliminated.

Proposing an aim which can not be realized is like making a rule which cannot be followed. Any challenge that can not be met will be passed over for those which have more realistic possibilities.

The result is a lessening of the control which was so hopefully sought. Instead we should express our goals as short term tangible targets which, when achieved, may move us closer to the ideal.

First we must convey that safety is not a doctrine of risk avoidance. The very notion is contrary to human behavior and the instincts which foster growth. In fact, our principal fear may be fear itself.

Psychologically, it is believed that in a threatening situation individuals may react negatively and ignore warnings. It would be more appropriate instead, to emphasize that safety is controlled risk-taking.

In this concept the professional work of the safety specialist is implementing risk control so as to limit accidental harm to people, products and materiel.

Prevention is not the key here, but limitation of inherent hazards is. An effort to control hazards may produce their eradication, but not always.

This notion is not incompatible with present approaches. It is merely an emphasis of their more realistic aspects, and it has several advantages.

It increases the credibility and practicality of safety work, with the many implied benefits such recognition would bring. It encourages scientific approaches to safety, rather than the tub-thumping promotional devices now so frequently relied on. It is familiar and proven.

Consider if you will the common pressure vessel as an example. It probably would be possible to design a pressure container which could not possibly fail. Also it may be proposed, that when suitable instruments are provided, an operator whose safety awareness is high will not allow dangerous pressures to develop. The construction costs for a never-fail piece of equipment, however, would far outweigh its utility.

We know too that it would be impractical to be dependent entirely on human watchfulness to control so great a potential hazard.

The problem is neatly solved, however, by giving first consideration to providing mechanical devices for limiting the risk when an accidental over-pressuring occurs.

The partial discharge of the contents, when a rupture disc or pop-off valve lets go, surely is accidental. Although the loss of the product is unwanted, a potentially grave risk is neutralized with practicality.

If the reasoning has been clear, it should be evident that philosophically a stressing of environmental or technological controls should be the first order of business in the practice of safety engineering.

I shall try to show later that this consideration will become increasingly vital because of changing situations in the modern world. Let us look first, however, at some historical experience in order to give the viewpoint perspective.

The current issue of *Accident Facts*, page 28, is the source of a 1926 through 1960 comparison of National Safety Council reporters' work injury experience.

FREQUENCY RATES DOWN

These figures show a notable 81% reduction in frequency rates over the time span. The severity rate improved too, but not as much, and here may be a clue that beckons us towards reconstituting the engineering or technical content of safety work.

When you read further in the data you find that the percent distribution of fatal and permanent total disability cases increased 71% in 1960 compared to 1926; the permanent partial cases increased 117%. Only temporary total disabilities represent a smaller percentage of the total.

Thus we see that while disabling injury rate occurrence has been reducing commendably over the years, there has not been equal or proportional improvement in the reduction of very severe accidents. To some of my associates this may be just a matter of chance. The more realistic point of view, it appears, is that the concept of limitation of risk (or control of severely hazardous exposures) has not fully been utilized.

Can there be surprise that the public may be looking for leadership from regulatory agencies in the control of severe exposures?

The nature of safety's problems, it seems, requires that the technological or engineering approach is the basis for solution. The measure of safety engineering performance is the degree to which risk potential is reduced.

EVALUATE SAFETY SYSTEMS

The technique for appraising the extent of practical control is not extraordinary. All that is required, in evaluating a system or process, is to lead an aggressive inquiry, challenging the controls each step of the way. The intelligence thus developed would be more or less forced towards practicality and its acceptance would be maximized.

One might say that a concept has been developing for professional safety work, although we may not always have been sensitive to it.

Nicholas Murray Butler, once President of Columbia University, said that people could be placed into three classes: the few who make things happen, the many who watch things happen, and the overwhelming majority who have no idea of what happened.

Changes are taking place now which will materially affect the course of safety and the future of safety engineers. Recently Frank McElroy, chief of the Industrial Hazard Division, U.S. Department of Labor, observed that in the low disabling injury frequency rate industries, a very high proportion of the employment was in the relatively large establishments (those over 500 employes).

These are industries, he points out, in which strenuous manual labor is at a minimum. All but one were relatively new industries and generally the plants and facilities were new and efficiently designed. All are industries in which the plant investment per worker is relatively high.

In other words, as work situations are modernized, the labor and hazard content of jobs are reduced. Practically everyone knows that the trend is towards more sophisticated mechanization of work.

Nevertheless, the image which many have of the man at work already is somewhat behind the times and will change even more radically during this decade. The significant alterations in the picture are:

a) a sharp rise already in the number of professional, technical, managerial and staff specialists in industry and the prospect of an even greater increase.
b) a levelling off or decline in the percent of unskilled workers.
c) a demand for more skilled workers with the requirement that many new skilled trades will be developed.
d) a sharp percentage increase in the number of service, clerical, and sales workers, which presently exceeds all other categories of occupations.

Thus, we find the work force changing in such a way that manhour totals will represent principally those occupations which are relatively free of hazard. As a consequence work injury frequency rate computations will have little significance.

Even now, many large companies have achieved rates that are effectively zero for many plants. If we were to remain wedded to injury frequency rate reductions as the goal of our service, particularly in work situations, it seems clear that the safety specialist eventually would be as necessary as a buggy whip.

On the other hand, the changing conditions will continue to require maximum hazard control, but the problems will be more sophisticated and any oversights more costly. It will become increasingly imperative to design and build systems which will perform their function without jeopardizing significantly any desirable aspect of the operation.

Such work, of course, is typically engineering with admixtures of the experimental psychologists' contributions.

SAFETY IN TODAY'S WORLD

At this point, one might ask where does safety as an engineering specialism fit into the changing world's picture? The answer does not seem difficult. True, every engineer in the pursuit of his profession must be aware constantly of his design's safety requirements. However, man acts as if events with small probability will not happen at all.

The engineer, for example, when making his plans, does not provide for all the possibilities which are logical. He largely ignores the exceptional.

The safety engineer contributes the intelligence required for the identification of risks, the correct appraisal of degree and the persuasion of practical methods for any needed controls.

However, he cannot follow a doctrine of total safety if he is to fulfill his responsibilities to all who may be influenced by his practice. To do so limits his acceptability and therefore his effectiveness.

To cite a current situation, it is probable that a preoccupation with absolute safety has greatly slowed our progress in exploring space. All risks may be removed by prolonged unmanned testing of space vehicles, but early manned flights, with the risks controlled to a practical degree, would be more realistic.

Our look into the future has revealed a changing world, where employes may enjoy working conditions once available only to executives. Where people may be hired principally to make decisions based on information supplied by analytical systems.

OFF-JOB HAZARDS GROW

The technological wonders stimulated by business competition, however, will not be found quickly in non-occupational areas. Today the typical employe is much safer at work than he is off-the-job and we can expect the gap to widen considerably.

The growing non-occupational risk to safety and health can be expected to increase monumentally over a relatively short span.

At present, the national population is multiplying at the rate of over 2.9 million per year, or 240,000 per month. That is the equivalent of adding a Providence, Rhode Island, to our metropolis total every 30 days.

It is predicted that by 1975 the metropolitan areas of the United States will occupy twice the area they do today. The need for plans for providing adequate water supplies, cleaning the air and safely moving people within the city, as well as to its suburbs, clamors for immediate attention.

Across the country, the off-the-job safety needs seem to grow faster than our resources for meeting them. Years are consumed quickly while plans are made, money raised and facilities constructed.

Meanwhile the progressive growth will relentlessly encroach on our comfort and safety. A complication is the general indifference to taking effective action. Compare the nation's off-the-job safety complacency to the uneasiness that exists over the possibility of atomic attack, when in fact the chance of dying by accident is far greater, at this moment, than the threat of a nuclear bomb.

The relative casualness to familiar safety problems is a phenomenon that seems to have resisted the sustained, long span promotional and logical approaches. Perhaps the appeals have been too flat. Possibly an approach with a touch of genius may stimulate the safety awareness so

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eagerly sought—but that does not seem to exist in the future.

Instead, if our crystal ball is not too cloudy, we will see a growing need for a somewhat different type of safety engineering specialism than is presently practiced. In industry, we can expect a diminution of the necessity for stimulating employe safety awareness.

There will be a slow but increasing recognition of the value of more direct and positive approaches to achieving accident reductions. The safety specialist who will move with these changes and, in fact lead them, will be less concerned with the development of safety rules and the inciting of broad safety interest.

Instead he will be an analyst who prepares objective, relatively indisputable, strongly persuasive intelligence on accident problems. He will have foresight and imagination so that he can foresee difficulties before they become acute.

ROLE OF SAFETY LEADERSHIP

He will be practical in his outlook and so his appraisals will be recognized for their imperativeness. His counsel will be responded to promptly and corrective action will be swift because it will be clear that failure to do so will result in intolerable loss.

He will maintain a courageous and demanding point of view with respect to himself and his profession, realizing that it is only by penetrating measurements of his work and those who will implement it, that safety progress will be achieved.

While opposed to taking risks merely for the sake of risk taking, his doctrine will be to encourage ventures but only when analysis indicates a desirable potential in the offing.

His practice will be devoted to identifying, classifying and teaching the practical controls needed to limit probable loss. It is in such a practice that the conflict of emotions, which often confuse the safety effort, can be given direction.

This golden anniversary of safety engineering, therefore, must start a new dynamics of safety leadership. If not, the role we play can be expected to diminish and the bright hopes of that small group of men, 50 years ago, will become leaden.

The test will be whether we can create an accident control situation which common sense, without the grace of genius, can deal with successfully.

Calendar

1961

Los Angeles, California—American Institute of Electrical Engineers Appliance Technical Meeting. Biltmore Hotel. ■ **November 6**

Chicago, Illinois — American Nuclear Society General Meeting concurrent with Atomic Industrial Forum, Atomfair and National Youth Conference. Conrad Hilton Hotel. Information from John L. Kuranz, Vice President, Nuclear-Chicago Corp., 333 E. Howard St., Des Plaines, Ill. ■ **November 6-10**

New York City—American Society of Tool and Manufacturing Engineers Prototype and Short Run Tooling Methods Seminar. Belmont Plaza Hotel. ■ **November 8-9**

Gainesville, Florida—Highway Engineering Conference sponsored by the University of Florida College of Engineering and Florida Engineering and Industrial Experiment Station. University of Florida. ■ **November 9-10**

Pittsburgh, Pennsylvania — Association of Consulting Chemists and Chemical Engineering meeting on Use of Technical Experts in Legal Work. Pittsburgh Hilton Hotel. ■ **November 10**

Phoenix, Arizona—Magnetism and Magnetic Materials Conference sponsored by Institute of Radio Engineers, American Institute of Electric Engineers, American Institute of Physics, Office of Naval Research, American Institute of Mining, Metallurgical and Petroleum Engineers. Westward Ho Hotel. ■ **November 13-16**

Detroit, Michigan — American Public Health Association 89th Annual Meeting. Information from American Public Health Association, 1790 Broadway, New York, N.Y. ■ **November 13-17**

New York City—Manufacturing Chemists' Association 11th Semi-Annual Meeting and Midyear Conference. Information from Manufacturing Chemists' Association, Inc., 1825 Connecticut Ave., N.W., Washington 9, D.C. ■ **November 21**

New York City—American Institute of Chemical Engineers Annual Meeting. Commodore Hotel. ■ **December 3-6**

1962

Detroit, Michigan—Society of Automotive Engineers Annual Automotive Engineering Congress and Exposition. Cobo Hall. ■ **January 8-12**

Washington, D. C.—1962 President's Conference on Occupational Safety sponsored by the U. S. Department of Labor. ■ **March 6-8**

Denver, Colorado—58th annual American Concrete Institute convention. Brown Palace Hotel. Information from American Concrete Institute, P.O. Box 4754, Redford Station, Detroit 19, Mich. Exhibit information from Mr. Orley O. Phillips, Phillips, Carter, Osborn, Inc., 831 Fourteenth St., Denver 2, Colo. ■ **March 12-15**

Dallas, Texas—23rd Annual Texas Safety Conference and Governor's Highway Safety Conference sponsored by Texas Safety Association. Adolphus Hotel. Information from Texas Safety Association, 830 Littlefield Building, Austin, Texas. ■ **March 25-28**

Pittsburgh, Pennsylvania—37th Annual Western Pennsylvania Safety Engineering Conference and Exhibit. Jointly sponsored by Western Pennsylvania Safety Council and Western Pennsylvania Chapter, A.S.S.E. Pittsburgh Hilton Hotel. Information from Harry H. Brainerd, Executive Manager, Western Pennsylvania Safety Council, 305 First Federal Building, 600 Grant St., Pittsburgh 19, Pa. ■ **March 27-29**

Boston, Massachusetts — 41st Annual Massachusetts Safety Conference and Exhibit. Sponsored by Massachusetts Safety Council, Safety Council of Western Massachusetts and Worcester County Safety Council. Hotel Statler Hilton. For Exhibit information write Bert Harmon, Manager, Massachusetts Safety Council, 54 Devonshire St., Boston 9, Mass. ■ **April 2-3**

Chicago, Illinois—American Industrial Health Conference. Sponsored by Industrial Medical Association, American Association of Industrial Nurses and American Association of Industrial Dentists. Pick-Congress Hotel. Information from Industrial Medical Association, 55 E. Washington, Chicago 2, Ill. ■ **April 10-12**

New York City—32nd Annual Regional Safety Convention and Exposition sponsored by the Greater New York Safety Council. Statler Hilton Hotel. Information from Greater New York Safety Council, Lincoln Building, 60 E. 42nd St., New York 17, N.Y. ■ **April 9-13**

Obituaries

JOHN F. HENNESSY, Metropolitan Chapter died recently at the age of 80. Mr. Hennessy was associated with the State of New York in the safety engineering department of the State Insurance Fund from 1925 until his retirement in 1951, at which time he was supervising safety engineer. He joined our Society in 1935 and was elected to Life Membership in 1951. ■

DAVID L. LEONARD, Boston Chapter died September 7. He was 50. A member of our Society since 1955, Mr. Leonard was assistant to the safety engineer at Simplex Wire and Cable Co. from 1954 until his death. He served his chapter as treasurer during 1958-59. ■

HAROLD H. PATRICK, died recently at the age of 50. A member of the Tulsa Chapter since joining our Society in 1958, Mr. Patrick was engineering representative for Standard Accident Insurance Co. of Tulsa when he died. He had been associated with the firm since 1945. ■

• Architects drawing of the new $12 million United Engineering Center which will be dedicated this month. The center, largest of its kind in the world, houses 19 engineering organizations.

United Engineering Center Opens in New York City

NEW YORK—Nineteen engineering organizations have moved into the new 20-story, $12 million United Engineering Center on United Nations Plaza, between 47th and 48th Streets in New York City.

The old Engineering Societies Building at 25-33 W. 39th Street, which was made possible by a $1.5 million gift from Andrew Carnegie, had been occupied by many of the present organizations in the United Engineering Center for more than 50 years.

The new Center becomes the largest concentration of professional engineering societies in the Free World. The occupants include the five "Founder Societies—the American Society of Civil Engineers, the American Institute of Mining, Metallurgical, and Petroleum Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, and the American Institute of Chemical Engineers.

Others are the American Institute of Consulting Engineers, American Institute of Industrial Engineers, American Society of Heating, Refrigerating and Air-Conditioning Engineers, American Welding Society, Engineering Foundations, Engineering Index, Engineering Societies Library, Engineering Council for Professional Development, Engineers Joint Council, Illuminating Engineering Society; Society of Women Engineers, The Municipal Engineers of the City of New York, and Welding Research Council.

The Center is owned and operated by the United Engineering Trustees, Inc., agency of the five "Founder Societies." Its occupants represent a total world-wide membership of 300,000.

Formal dedication has been scheduled for early this month, with former President Herbert Hoover as Honorary Chairman. Ground-breaking, at which Mr. Hoover officiated, took place on October 1, 1959, and the cornerstone laying ceremony, at which Mr. Hoover again officiated, was held June 16, 1960.

The old Engineering Societies Building was opened in 1906 as a 13-story headquarters to which three stories were added later. In recent years, the 39th Street structure has been increasingly inadequate for the space demands of the Societies with their fast growing memberships and services.

The 20-story United Engineering Center stands on a plot of 37,024 square feet, with a United Nations footage of 200 feet and 10 inches along a full block; 147 feet on 47th Street and 220 feet on 48th Street. The Center is 283 feet high above the curb, a slim tower of stainless steel, limestone and glass rising from a two-story granite base for a gross area of 257,640 square feet.

U.S. Fire Losses Climb to Peak High, NFPA Reports

BOSTON—The U.S. set a new record in destructive fires last year, according to the National Fire Protection Association.

More than $1,544,000,000 worth of property went up in smoke during 1960, the international fire safety organization estimated in its annual report. This is the first time in history that U.S. fire losses have reached and exceeded the $1.5 billion mark.

With the 11,350 Americans killed by fire—more than half of them in their own homes—reported earlier by the association, the year added up to the worst on record.

The unprecedented destruction of life and property occurred in almost 2,124,000 fires.

Principal causes of fire, according to the NFPA analysis, were careless smoking, defective heating and cooking equipment, electrical defects, and mishandled flammable liquids.

Fire destroyed or damaged more American homes than ever before, with a total of 563,000 dwellings hit. Over 6,000 lives were taken in these fires, about half of them children. Losses to homeowners mounted to $346,200,000.

Comparable figures for the previous year were losses of $312,000,000 in 542,000 fires.

The 1960 property loss total exceeded the previous year's by more than $100,000,000, and the number of fires was up 9,500. Almost half the dollar increase came from a single fire, the $48,000,000 fire of last December aboard the nearly-completed U.S.S. Constellation at Brooklyn Navy Yard, which also caused 50 deaths.

Residential building fires accounted for nearly $25,000,000 of the increase, industrial plant damage rose about $14,600,000, and the loss from forest fires was up nearly $12,900,000.

• Fire losses last year exceeded the $1.5 billion mark, for the first time in the history of the U.S., the National Fire Protection Association disclosed.

Technical Literature

BOOK REVIEWS
STANDARDS - CODES
GUIDES - DATA SHEETS
MANUALS - BOOKLETS
FILMS - VISUAL AIDS

Standards—Codes

Stopping Powers for Use with Cavity Chambers, National Bureau of Standards Handbook 79 has been prepared by a task group of the National Committee on Radiation Protection and Measurement. The 85-page report presents a critical review of the literature concerning the stopping power ratio used in the interpretation of cavity ionization measurements in radiation dosimetry.

Copies may be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., at 35 cents per copy.

National Fire Codes, a new and revised seven volume edition has just been published by the National Fire Protection Association. These 1961-62 Codes incorporate 48 fire protection standards adopted by the NFPA plus 138 other current standards. Material is divided into categories covering flammable liquids and gases; combustible solids, dusts, chemical and explosives; building construction and equipment; fixed extinguishing equipment; electrical; transportation; and mobile fire equipment, organization and management.

The National Fire Codes are available from the Publications Department, National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass. at $7 per volume, $40 for the set of seven volumes.

Manuals—Booklets

Matheson Gas Data Book is now available from the Matheson Co., Inc.

The manual contains data on every compressed gas available for laboratory use including specifications, physical constants, chemical properties, physical data, uses, recommended controls and other information. Safe handling procedures are suggested on each gas, and a discussion of toxicity and first aid procedures is included for each hazardous gas. A separate chapter is devoted to safe handling of compressed gases in the laboratory.

Copies of the Gas Data Book are available at $8.00 each from the Matheson Co., Inc., P.O. Box 85F, East Rutherford, N.J.

Safety-Maintenance Directory and Manual of Safety Techniques has been published by Alfred M. Best and Co.

The manual covers new trends and findings in are areas of industrial toxicology, hygiene, maintenance, fire control, first aid, ventilation and noise control. Included are specifications, records, practices, hazards, studies, check lists charts, graphs, tables, rules and procedures in industrial safety developments.

Available from Alfred M. Best Co., Inc., 75 Fulton St., New York 38, N.Y. at $10.00 per copy.

The Traffic Accident Epidemic written by Don Ross of the New York Herald-Tribune is now available in reprint booklet form. The booklet, which appeared as a series of newspaper articles, deals with the many problems facing motor vehicle administrators and reports on interviews with leading safety authorities.

Copies of the booklet are available from Mrs. Mae W. Stabler, Director of Information, The New York Herald-Tribune, 230 W. 41st St., New York 36, N.Y. at 25 cents per copy.

Talk Topics, the new 96-page book published by the National Safety Council is designed to promote and facilitate the holding of safety seminars. The book contains stories, facts and ideas and questions about safety. Subjects include handling materials, falls, struck by falling or moving objects, machinery, tools, electricity and fires, safety habits, first aid, attitudes, personal protective equipment and off-the-job safety.

Copies are available from NSC, 425 N. Michigan Ave., Chicago 11, Ill., at $2.25 per copy.

Miscellaneous

Fire and Fire Losses Classified, 1960 has been prepared by the NFPA Fire Record Department and appears in the *NFPA Quarterly* of October, 1961.

Reprints of the report are available from the National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass., at 25 cents per copy.

Safetygraphs for use as training aids have been made available by the National Safety Council. Safetygraphs are flip-type charts of 18 x 24 in. color illustrations accompanied by pertinent text material. A leatherette easel is also offered which supports the safetygraph and serves as a portfolio for storing and carrying when not in use.

Included are safetygraphs on "Housekeeping," which emphasizes the accident prevention values realized when an organization practices proper housekeeping principles in building layout; "The Air You Breathe Aboard Ship," discussing hazardous atmosphere found in ship

repair work; "Burning and Welding (Maritime)," concerning safe apparel, equipment, housekeeping, ventilation, fire prevention in ship repair work; "Static Sparks and Flammable Liquids," showing how static sparks are caused and how to protect against hazards; "Hazards of Water in Closed Process Systems," covering hazards involved in uncontrolled mixing of water and hot materials in a closed process system; "Falls Hurt," showing the principal causes of common falls that occur in industry and at home and the remedy to eliminate these causes.

The Safetygraphs may be obtained at $14.00 each from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Wisconsin Governor Terms Traffic Toll A 'National Scandal'

Wisconsin's Governor Gaylord Nelson has issued a call to "get tough" about traffic safety.

Speaking to the Emergency Highway Safety Conference he called earlier this year, Gov. Nelson said "proclamations and declarations about traffic safety are no longer enough! The crisis is here. We must turn the tide or prepare to live with continuing disaster."

The chief executive of Wisconsin told about 140 delegates who attended the conference that the trend in traffic injuries is up in every part of the State. The national death toll, which is approaching 40,000 annually, he said is a "national scandal."

Subsequent to the Governor's conference, the Wisconsin Council of Safety, Traffic Division reviewed his proposals and endorsed compulsory vehicle inspection, minimum speed limits, maximum speeds set by State Highway Commission for state and federal roads, state aid for driver education, uniform traffic ordinances and court procedures, official encouragement of use of auto seat belts, a separate safety division in the state motor vehicle department under a full-time director, and a long-range study of reexamination of drivers.

According to William R. Redmond, Wisconsin Council of Safety vice president and a member of the A.S.S.E. Milwaukee Chapter, the proposals will be studied in order to make recommendations to Gov. Nelson for action by the 1961 and 1963 legislatures.

LACK OF STATE FUNDS CLOSES MSU HIGHWAY SAFETY CENTER

The Highway Traffic Safety Center of Michigan State University, one of a small handful of safety centers established at universities, is being terminated. "Phasing out" operations at the Center began on July 1.

This decision was necessary because of inadequate legislative appropriation to the University, President John A. Hannah said.

To what extent and depth activities which have been conducted by the Center will be eliminated or curtailed has not been fully determined.

"It is with much personal regret that this decision had to be made," Dr. Hannah said, "for my own conviction concerning this program and the need for more Centers like it in other State universities has often been expressed.

"While the value of the Center's program is recognized and its contributions to the State and nation in the vital area of traffic are considerable, the responsibility for discontinuing the Center under existing financial difficulties does not rest with MSU alone.

"The problems of traffic safety in our State and Nation concern everyone," Dr. Hannah said.

Most of the Center's staff members will be transferred to other departments within the University as teaching and service activities are realigned.

The Center was established in 1955 after a two-year study conducted under the auspices of the Association of Land-Grant Colleges and Universities, through $10,000 in grants from the Automotive Safety Foundation, had established the need and pattern of organization adopted at a special session of the Michigan Legislature.

Gordon H. Sheehe, director of the Highway Traffic Center, declared that its closing is "a tragic loss for the people of Michigan and in a sense to the National as well."

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quested and received an appraisal service.

Those meeting appraisal standards are being recommended for accreditation by the Council—a guarantee of high quality program and competent staff under the policy direction of strong citizen boards.

The Council conducts a vigorous program of public information designed to keep the nation fully informed of the accident problem, and to influence as many individuals as possible to accept personal responsibility for preventing accidents.

Broadly, this continuing effort falls into three categories—publicity, public appearances, and the Council's own 11 magazines, 40 newsletters and numerous other publications.

● A view of the interior of NSC headquarters shows part of its staff of 375 who work in a two-floor office totaling more than 100,000 square feet of space. The expanse of the office often leaves first-time visitors agape when they enter, expecting to find a handful of staff persons at their desks.

$4 MILLION OF SAFETY

In doing this, the Council each year distributes nearly $4 million worth of safety materials. One of the U. S. Post Office's biggest customers, tons of mail leave its Chicago headquarters annually, including posters (10,000,000), employee magazines (11,339,000), technical and administrative periodicals (3,760,000), manuals and technical publications (1,234,000), and booklets (8,300,000).

In the print media field, the Council works closely with daily and weekly newspapers, consumer and business magazines, company employee publications, and free-lance writers to keep the safety story before the public. More than 1,700 daily newspapers use NSC materials to a greater extent than those for any other public service cause!

Four thousand radio stations and 650 television stations regularly receive spots, scripts, transcriptions, slides and films. Talent for much of this material is contributed by top entertainment personalities in their capacity as members of the National Safety Council's Motion Picture, Radio and Television Committee.

"STOP ACCIDENTS" DRIVE

The National Safety Council reaches the American people with more information than any other public service organization!

Augmenting the Council's direct program is the "Stop Accidents" campaign of the Advertising Council, one of the 13 major public service campaigns it conducts. The program consists of two distinct campaigns a year—one in spring and summer, another in fall and winter.

Each campaign utilizes all forms of media—ads for newspapers in mat form, slides and film spots for television, spots for radio and fact sheets for newspapers, special ads for national magazines, trade journals and employee publications, and outdoor panels contributed by the Outdoor Advertising Association of America.

The tremendous response of advertisers and media to the campaign is measured by the fact that the estimated contributed time and space in one year has a value of $10 million.

3,000 PUBLIC APPEARANCES

Members of the Council headquarters and field staff make about 3,000 public appearances a year before organizations, in classrooms and training institutes, and on radio and television programs. Such appearances, often accompanied by publicity, spread the safety gospel ever wider.

The Council has set up, through its Research and Statistics Department, a vast reporting system among its members and government vital statistics bureaus. Machine tabulation enables the Council to keep its finger on the pulse of accident experience.

How many accidents, where and when they happen, to whom they occur, even much of the "why"—all flow into the Council headquarters to guide the concentration of effort in the most critical areas, to identify trends, and to provide the means for one member to compare his achievements with others in his field of interest.

The Research Division seeks to increase the effectiveness of research facilities, and research itself, by maintaining an information service on research work by schools, research groups, safety organizations and others.

Through the *Research Review*, published quarterly, such information is made available so that those engaged in research will know of the areas under study, and so that those in safety program work can put research findings into practice. Approximately 500 research projects have been reported on in the Review.

In addition to its publication work, the Council is represented on all leading research committees in the nation and participates in the planning of investigations.

For many years the Council has conducted research into the hazards of winter driving, the results of which have been of substantial value to the transportation industry and to the public.

Accident Facts, a 100-page statistical yearbook, is published by the Council as a standard reference work on accident experience. Numerous other statistical bulletins, summaries and special reports are published.

STATISTICS DIVISION

The Statistics Division publishes *Accident Facts*, industrial accident rates, accidental death bulletins, and writes the monthly statistical summaries and barometers in Council magazines.

It administers award plans for industrial members, air lines, and 32 contests covering employe and fleet operations. More than 4,000 awards were earned by Council members under these plans during the past year.

The Council's Library maintains the largest collection of information

on safety in the world, and last year alone handled more than 20,000 inquiries on every conceivable safety question, including one from U. S. Attorney General Robert Kennedy's office asking about injuries in touch football.

PROVIDE MEETING GROUND

Since its inception as a cooperative association, the Council's most important function has been to provide a meeting place where people come together to work out solutions to safety problems. Thus the best experience of the past and the greatest insight into the future is available to the safety worker.

In a telephone consultation, or a training class of 30 people, or the week-long National Safety Congress attended by 12,000, the Council becomes a clearinghouse of knowledge and method to prevent accidents.

The Council professional staff alone would be a David against the Goliath of accidents. But the cooperative knowledge and influence of thousands, channeled through the Council as an operational center, gives the safety movement its unity and strength.

The far-reaching influence of the safety movement stems not alone from Council-conducted programs, but also from what members of the Council and its many cooperating organizations accomplish in their own spheres of activity and on their own initiative.

NSC CHURCH PROGRAM

Churches, youth organizations, trade and service associations, medical societies and recreation groups are among the many organizations which come to the Council as a meeting place, and then serve accident prevention in their own areas of interest and influence.

Serving the nation through its Church program, the Council has sought to add a new and vital dimension, to the solution it offers for the needless waste of human life, health and property.

Clergymen of all faiths have rallied to the crusade of the National Safety Council and the National Committee of Religious Leaders for Safety to awaken the conscience of Americans toward accidents.

Thousands of ministers, priests and rabbis and the lay leaders associated with them have indicated intense concern in this social problem. The press, radio, television and outdoor advertising industries have proved to be unusually interested in this increased stress by the Council on the basic theme that we are "Our Brother's Keeper."

The National Committee of Religious Leaders for Safety, is a distinguished group of clergy and laity representing denominationally and geographically the nation's 100 million citizens affiliated with organized religion.

Spearheading safety activities among the 50 million young people of our nation who are members of youth organizations is the NSC Youth Service Committee. The committee provides a channel of communication between youth organizations and Council service, develops plans for youth service, and acts as an advisory body to the NSC staff.

YOUTH STRESSES SAFETY

The Boy's Clubs of America, Boy Scouts of America, Future Farmers of America, Future Homemakers of America, 4-H Clubs, Camp Fire Girls and other groups are giving special emphasis to traffic safety in their projects. Other organizations aim at home and recreation safety.

The Council maintains close liaison with medical societies, which view accidents as a health problem of epidemic proportions. In the growing area of recreational safety, in which water hazards are the most important, the Council is stimulating and supporting the safety programs of a large number of boating, fishing and swimming interests.

Leaders of organizations concerned with outdoor recreation comprise the Public Safety Committee of the National Safety Council. Typical of the committee's cooperative activity is the emphasis on the Learn to Swim program, which is spreading an effective safety precept to all ages.

"MUCH REMAINS TO BE DONE"

Former Governor of Arizona, Howard Pyle, President of the National Safety Council, looks upon its multitude of operations realistically. "So much remains to be done," says Governor Pyle, "if the Council is to fulfill its obligations and opportunities. I am speaking of intensive research into the cause of accidents, and into human behavior as it relates to accidents. Expansion of safety education so that it reaches every age and every group. Improvement and clarification of the relationships between local safety organizations and the National Safety Council. A more vigorous and effective public relations program so that the American public may more fully support the Council by its actions and resources."

New Members

The following new members, shown by chapter, were elected during the month of September.

ARK-LA-TEX
Louis E. Jenkins
James P. Stanley

CONNECTICUT VALLEY
William P. Cavalieri
Weston J. Gourley
James E. Nordeng

EAST TENNESSEE
James H. Whillock

EASTERN NEW YORK
Harry L. White

HAWAII
Roy J. Perreira

MEMPHIS
Joseph A. Withee

MISSISSIPPI
Alton W. Lipscomb, Jr.
Arthur E. Wiselogel

NEW JERSEY
Clarence R. Fitzsimons

PORTLAND
Joseph A. Huber

ST. LOUIS
Roy P. Hamilton
James D. Lengyel
Robert J. McDonald
William A. White

SOUTHWEST
William C. Wigington

UTAH
James G. Cayias
Clinton E. Day

WEST FLORIDA
Robert S. George
Robert G. Molloy

WESTERN PENNSYLVANIA
Walter B. Cunningham
Ferdinand J. Parrish

WICHITA
Bob R. Early

MEMBERS-AT-LARGE
Gerald L. Agnew
Ernest R. Amerie
Frank Cretella
Reuben O. Edwards
Fred S. Gould
James W. Jeffries
Harold A. Seward

LAWS AND REGULATIONS

ARKANSAS

The Arkansas Senate has passed a bill which excludes heart attacks and strokes from the definition of injury under the Workmen's Compensation Law "unless caused by extraordinary and unusual physical activity by the employe in the course of his employment."

In other actions, the Senate passed a measure to increase the funeral expense allowance under Workmen's Compensation from $250 to $500.

CALIFORNIA

A major financing and benefit bill, AB 234, was passed by the California Legislature setting a precedent in the area of unemployment disability compensation insurance by providing for (1) automatic increases in the taxable wage base each year from 1962 to 1965 and (2) an increase in the weekly maximum benefit from $65 to $70 and the application of an escalator formula, effective in 1963, which will gear benefits to two-thirds of the average weekly wages in covered employment.

In the first action of its kind in the United States, the Governor of California signed an extension of coverage to agriculture, under terms of bill AB 1663. The bill will affect an estimated 290,000 workers.

Other actions passed by the California Legislature included proposals to amend Section 7682, Labor Code, to delete the requirement that annual inspections of boilers by the Division of Industrial Safety be both internal and external inspection; additions to Section 7320, Labor Code, to require that on July 1, 1962, or before, all elevators in all buildings, other than in private homes, used for the carriage of passengers shall be equipped with an emergency alarm in workable order; and added to the Health and Safety Code to enact a California "Hazardous Substance Labeling Law" covering intrastate commerce patterned after the Federal Hazardous Substances Labeling Law.

ILLINOIS

As the result of affirmative action by the Illinois Legislature, measures have been passed which consolidate the safety inspection and education divisions in the Department of Labor. This action is expected to result in more efficient operation of these functions. It will create an advisory board consisting of four employers and four labor members.

Formerly there was one division responsible for safety inspection and another responsible for safety education, with consequent overlapping responsibilities. The combining of these divisions will place more emphasis upon the important function of safety education.

The Illinois Senate rejected measures which would have relieved an owner of property from civil or criminal liability for scaffold accident injuries sustained by an employe of an independent contractor. During consideration of this legislation the Illinois Supreme Court rendered a decision which, in effect, holds that in most cases property owners would be relieved of liability for scaffold accidents. However, this decision does not apply to subcontractors.

A number of changes were made in the Illinois Workmen's Compensation and Occupational Diseases Acts (Senate Bills 775 and 776). These amendments provide:

—Increases in maximum weekly compensation rates from $6 to $10 in the various classifications, with a weighted average of 15.2 per cent.

—Increases in maximum death benefits of from $1,250 to $2,500 with an average increase of 11 per cent. (This will also result in corresponding increases in the amount recoverable in cases involving permanent total disability and permanent partial disability.)

—In *all* death cases a $500 burial allowance will be paid. (Previously the burial allowance was payable only where the employe left no surviving dependents.)

—The maximum recovery for the loss of sight in either eye has been increased 10 weeks.

—Where an artificial member or prosthetic appliance is damaged as a result of an accidental injury, or where dentures are damaged as a result of an accidental injury accompanied by physical injury, the employer shall replace or repair such denture or artificial member.

—Percentage of average earnings payable for temporary total disability was reduced from 75 to 97½ per cent to a new scale of 65 to 80 per cent. (This provision will have limited application however, because minimum weekly compensation rates to which a person is entitled, regardless of earnings, were also increased.)

—The statute of limitations relating to atomic radiation has been extended so that a worker will have five years rather than three years from the date of last exposure to radiation in which to assert a claim for disablement.

(Other provisions apply to credit for weekly payments in excess of compensation; the re-marriage of childless widows; and workmen's compensation claims adjustment companies.)

TENNESSEE

In actions by the Tennessee General Assembly, two changes were made in the Workmen's Compensation Law during 1961. In instances where the employe suffers serious disfigurement to the head, face or hands, materially affecting his employability and the employe is not compensated under any other section of the Law, the new provision provides for 65 percent of the average weekly wage subject to the maximum of $34 and minimum of $15 per week, for not exceeding 200 weeks to be determined by the court.

The Assembly's other change provides that when an employe or prospective employe has a prior history of heart disease, heart attack or coronary failure or occlusion, the employe may be permitted to waive in writing compensation from his employer or future employer for an aggravation or repetition of such condition. A medical statement giving the prior history of such condition must be attached to the waiver and both instruments filed with the State Commissioner of Labor.

3.5 MILLION VEHICLES SAFETY-CHECKED IN '61

WASHINGTON, D.C.—More than 3½ million vehicles were reported Safety-Checked in the 1961 National Vehicle Safety-Check program. This is the greatest number of vehicles checked in 13 years of reporting results of the safe driving condition of cars and trucks.

In announcing results of the program, Victor Holt, Jr., Chairman of the Auto Industries Highway Safety Committee, and Executive Vice President, Goodyear Tire and Rubber Company, said: "Vehicle Safety-Check facilities were provided in 3,448 cities and counties, at military installations, and industrial plants, as well as by government agencies, and teen-age groups conducting their own Safety-Checks for employes and young drivers."

"The finding of one or more unsafe items for every *six* cars checked indicates much still needs to be done to make owners aware of the need to maintain their vehicles in safe operating condition at all times," he said. "However, the fact that 47.4% of the program's participants took immediate steps to have corrections made to one or more of the 10 items checked as unsafe indicates a growing awareness of personal responsibility for the safety of the users of our streets and highways."

PRESIDENT ANNOUNCES REGIONAL CONFERENCES

WASHINGTON—President John F. Kennedy has announced a series of White House Regional Conferences to be held this month in 10 major cities to discuss domestic programs and future needs.

Experts in various fields of government activity, including cabinet officers and other top-ranking government officials will attend the conferences to explain new developments, legislative changes and future needs and plans.

The regional conferences will be held in Chicago, November 7-8; St. Louis, November 7-8; Houston, November 9-10; Nashville, November 9-10; Detroit, November 14-15; Cleveland, November 14-15; New York, November 16-17; Philadelphia, November 16-17; San Francisco, November 20-21; Los Angeles, November 20-21.

Topics to be covered at the conferences, of special interest to safety engineers, include education, recreation, rehabilitation, health, job retraining, physical fitness, mass transportation and civil defense.

• Literally buried in an avalanche of ballots is Arlene Michau of the Society's national staff, as members returned their votes to national headquarters last month. A total of approximately 3,550 ballots were received at the time of the Teller's Committee official canvass. This will be the last mail ballot for election of national officers since under the new Constitution, scheduled for adoption next January, elections will take place at the Society's Annual Meeting.

NFPA REPORTS ON

Explosion Hazards in Storage Tank Vents

IT HAS BEEN a general practice to design vents or vent weatherhoods for outdoor storage tanks so that their discharge openings face downward in order to provide protection for the tanks contents against rain, snow and air borne dust.

When such vents, or their protective weatherhoods are designed to discharge downward, any ignition of vapor escaping from vents which could result from a fire would cause the flame to impinge directly on the tank shell and produce localized heating. This "blow torch effect" which, if it continues long enough can cause weakening of the structure and result in a violent rupture and explosion of the tank.

A report made by the National Fire Protection Association on this subject disclosed that flame impingement has been the principal or major contributing cause of a number of serious tank explosions which resulted in heavy loss of life and property.

For eliminating this exposure, the National Fire Protection Association Standards No. 30 for the *Storage, Handling and Use of Flamable Liquids* require that the outlets of all vents and vent drains on tanks designed for 0.5 pounds per square inch or greater pressure be arranged to discharge in such a way as to prevent localized overheating of any part of the tank in the event vapors from such vents are ignited.

There are, now in use, tank vents which provide protection for the tank contents against the weather elements and atmosphere contaminants and still provide protection against any possible impingement of a flame on the tank shell. These vents providing both protections are of a design having a weatherhood secured to the vent body with a heat sensitive alloy.

When vapors from a vent of this design are ignited and in turn the seal is fused, the weatherhood is caused to drop and uncover the side opening of the vent so as to permit the discharge of the burning vapors to be directed horizontally instead of downward where the flame could impinge on the tank shell.

The explosion hazard inherent to tank vents of return bend types should be given consideration in your inspections of tanks used for storage of flammable liquids.

Society lauded continued

The B. F. Goodrich Company
J. Ward Keener, President

Armco Steel Corporation
Logan T. Johnston, President

The Martin Company
Douglas V. Dorman, Vice President

George A. Hormel & Co.
R. F. Gray, President

Minneapolis-Honeywell Regulator Co.
P. B. Wishart, President

Douglas Aircraft Co.
Donald W. Douglas, Jr., President

Worthington Corporation
A. M. Tullo, Vice President

Ford Motor Company
K. D. Cassidy, Vice President

Industrial Safety Equipment Assn.
E. W. Bullard, President

Colorado Fuel and Iron Corp.
A. F. Franz, President

Thompson Ramo Wooldridge, Inc.
D. E. Wooldridge, President

American Ceramic Society
Charles S. Pearce, General Secretary

American Association of State Compensation Insurance Funds
Harold Clark Thompson, Secretary-Treasurer

The Carborundum Company
Clinton F. Robinson, President

Carrier Corporation
William Bynum, President

The Rath Packing Company
Joe Gibson, President

Corn Products Company
John R. Rhamstine, President

American Society of Heating, Refrigerating and Air-Conditioning Engineers
John Everetts, Jr., President

Society of Plastics Engineers
Frank W. Reynolds, President

H. J. Heinz Company
Frank Armour, Jr., President

American Viscose Corporation
Gerald S. Tompkins, President

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Philip Ryan, President

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John E. Kenney, President

National Dairy Products Corporation
J. Huber Wetenhall, President

National Distillers and Chemical Corp.
Roy F. Coppedge, Jr., President

Studebaker-Packard Corporation
Sherwood H. Egbert, President

American Smelting and Refining Company
J. D. MacKenzie, President

American Society for Quality Control
William P. Youngclaus, Jr., Adm. Secretary

The Bendix Corporation
M. P. Ferguson, President

Pittsburgh Plate Glass Company
David G. Hill, President

Libby, McNeill & Libby
Charles S. Bridges, President

American Assn. for the Advancement of Science
Dael Wolfle, Executive Officer

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Charles S. Doerr, Executive Secretary

Armstrong Cork Company
C. J. Backstrand, President

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Norman Key, Executive Secretary

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E. F. Franz, Vice President

American Metal Climax, Inc.
Frank Coolbaugh, President

United State Steel Corp.
Edward C. Myers, Vice President

The Dow Chemical Company
L. I. Doan, President

● **Councilman-at-Large Theodore M. Hickey, representing New Orleans Mayor Victor H. Schiro, presents the Mayor's Proclamation of "Safety Engineers Day" to Edward J. Baird, chairman of the New Orleans Chapter, American Society of Safety Engineers. At right, is Michael L. Tackney, vice-chairman of the Chapter.**

The Sherwin-Williams Co.
E. Colin Baldwin, President

Republic Aviation Corporation
Mundy I. Peale, President

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Lynn A. Townsend, President

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American Standards Association
John R. Townsend, President

Hooker Chemical Corporation
F. Leonard Bryant, President

Northrop Corporation
Thomas V. Jones, President

American Academy of Occupational Medicine
John L. Norris, President

National Fire Protection Assn.
Percy Bugbee, General Manager

Wheeling Steel Corporation
Forrest H. Kirkpatrick, Assistant to Chairman

Kimberly Clark Corp.
R. G. Ison

Eli Lilly and Company
Truman D. Hoover, Vice President

Outboard Marine Corporation
William C. Scott, President

Lumbermens Mutual Casualty Co.
N. C. Flanagin

Personnel Center

(Job openings in safety engineering or in related fields are listed in this column at no charge. Employers may use their address or a Section number if so desired. We will assign the number and forward all applications received. Society members seeking positions may submit "Situation Wanted" notices for publication in this column. Members may use either their address or a Section number. Maximum words for either listing is 75. Copy for listings should be sent to THE JOURNAL, American Society of Safety Engineers, 5 N. Wabash Ave., Room 1705, Chicago 2, Illinois.)

JOB OPPORTUNITIES

Union Electric Company, electric utility in St. Louis, Mo., has an opening for a young, college graduate, safety engineer. Functions include reviewing engineering plans and drawings, analyzing accident statistical data, providing staff safety technical assistance, surveying activities for accident hazards, assisting in accident investigations and conducting safety meetings. Please send resume including salary thinking to Mr. John K. Stevens, Employment Manager, 315 N. 12th St., St. Louis 66, Mo.

■ ■ ■

Safety Engineer wanted with at least three years experience in industrial safety, preferably chemical, aeronautical, explosives, or research and development operations. Engineering degree preferred. Starting salary approximately $7500 depending on qualifications. Substantial salary increase semi-annually. Attractive job and living factors. Write to E. P. Marconi, ARO, Inc., Arnold Air Force Station, Tennessee.

■ ■ ■

Three safety engineers with some mechanical engineering background are needed by facility in Idaho. Some experience in construction is desired but not necessary. College degree is not required. Salary is in the range of $170 per week. Send resume to *Section 111, Journal of the American Society of Safety Engineers, 5 N. Wabash Ave., Room 1705, Chicago 2, Ill.*

■ ■ ■

Safety Engineer or Safety Specialist—with a bachelor's degree and three years of suitable experience for the new position of Field Safety Officer. The job will pay $8000 to start depending on qualifications and experience. Duties are those usual to industrial safety engineering including committee and conference work, inspections, consultation with supervisors and problem solving. Also involved will be writing of procedures, codes and standards. There is opportunity for advanced study and original work in safety and related fields. Safety programs of the University are correlated by the Safety Coordinator at Urbana, under direction of the Vice President and Comptroller. Write John Morris, Safety Coordinator, 605 S. Goodwin, Urbana, Ill.

Director of Operations for successful division of large diversified manufacturing corporation. To age 45 with M.E. degree and 15 to 20 years experience in manufacturing of machinery. A diversified work history with about three machinery manufacturing companies would be ideal, as would be line foreman experience. Reporting to this man will be the chief engineer, manufacturing engineer and director of purchasing. He must be capable of supervising in these three areas. Salary range has $15,000 base. For further information contact Mr. Daniel E. Clark, Associate, E. E. Wyatt and Associates, 105 W. Adams St., Chicago 3, Ill.

■ ■ ■

Several openings available for top-flight engineers in growing multi-line insurance company. General revamping of the engineering department necessitates the services of a mature man with strong leadership qualities. The company also is seeking field engineers in several midwest areas. These men must be well versed in the fields of commercial fleet operation and special risks as well as general risk procedures. Excellent opportunity with a forward looking organization. For information write *Section 112, Journal of the American Society of Safety Engineers, Room 1705, 5 N. Wabash Ave., Chicago 2, Ill.*

SITUATIONS WANTED

Safety Director or Engineer—37, married veteran, B.S. degree. Any location will be considered. 8½ years experience as director of safety program of plant with over 1500 employees and a wide variety of production processes. Two years experience with a community safety council in public relations and committee coordinating activity. Capable of administering program for safety, medical, workmens, compensation, security, fire prevention, insurance as well as many employee benefit functions. Resume on request. Write Robert L. Richards, 1134 Prince St., S.E., Grand Rapids 7, Michigan or call (Area Code 616) GLendale 2-1780.

■ ■ ■

Safety and/or Fire Protection Engineer—Registered P.E., member A.S.S.E. and S.F.P.E., government employee. 25 years experience in safety, health, fire protection and disaster control, military and civilian. Organized and administered successful programs in plants, bases and hg. Experienced in industrial, chemical aviation, construction, petroleum, explosives, high energy fuels and insurance. Conscientious and hard-working. Have no draft problems. Family man desires position of responsibility in progressive organization, with management support. Presently employed. No personal handicaps. Write *Section SW-64, Journal of the American Society of Safety Engineers, 5 N. Wabash Ave., Room 1705, Chicago 2, Ill.*

SAFETY ENGINEER

High Explosives Safety Engineer for the University of California, Lawrence Radiation Laboratory, a prime contractor for the AEC. Duties will consist of providing safety evaluation of high explosives processed through the stages of mixing, blending, pressing, machining and assembling.

B.S. degree in Chemical Engineering is preferred. Experience in industrial safety and explosive work is desired. Must be a U.S. citizen.

Send resume to Mr. K. E. Moseley, Personnel Department

LAWRENCE RADIATION LABORATORY

P.O. Box 808-AM
Livermore, California
(One hour from San Francisco)

An equal opportunity employer

New Products

NEW MSA DETECTOR

■ Measurement of 10 of the most frequently occurring halogenated hydrocarbons is now possible with a new detector developed by **Mine Safety Appliances Company, Pittsburgh.**

The M-S-A Halogenated Hydrocarbon Detector is designed to achieve maximum flexibility in a portable instrument for measuring toxic concentrations of such compounds as trichloroethylene, perchloroethylene, ethyl bromide, ethyl chloride, methyl bromide, and monochlorobenzene. The compounds are used principally in metal degreasing, dry cleaning, fire extinguishment, refrigeration, and as paint, varnish, and rubber solvents.

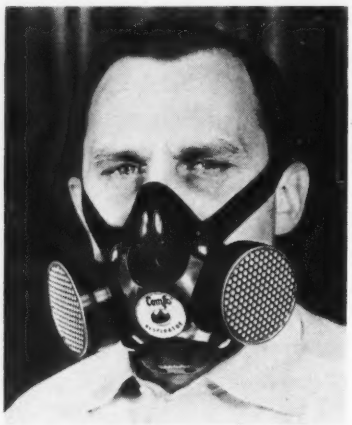
To achieve compactness and versatility, MSA engineers developed a two-part instrument: a reactor tube and a detector tube which are joined together for testing. The reactor tube contains two frangible glass ampoules of chemicals which are crushed and mixed immediately before use and serve to oxidize the halogenated hydrocarbon, releasing free chlorine or bromine. Two types of detector tubes are employed: one for hydrocarbons in Group A (e.g. ethyl chloride) and one for Group B (e.g. ortho-dichlorobenzene).

TRI-CLASS ABC EXTINGUISHERS

■ New 10 and 20 pound portable extinguishers, U.L.-approved for use on all three kinds of fire (Class A—wood, paper, cloth, etc.; Class B—flammable liquid; Class C—electrical) have been introduced by **Walter Kidde & Company, Inc., Belleville, N.J.** They bear U.L. ratings of 2-A, 16-B:C (the only 10 lb. general purpose unit with a 2-A rating), and 3-A, 20-B:C respectively.

Approved for non-metallic fire hazards, Kidde Tri-Class-ABC units simplify training of personnel. These portables feature one method of operation, one portable for use on any Class A, B, or C blaze. No possibility of error in matching extinguisher to hazard.

RESPIRATOR REDESIGNED



■ Economy and a higher degree of worker acceptance are two of the many benefits of **Mine Safety Appliance Company's** redesigned custom Comfo respirator, which now features an improved facepiece peripheral seal.

The advanced seal—including an inturned lip and deep chin cup cushion supported by a four-point floating suspension system—provides for a greater range of facial shapes and sizes. This minimizes the need for a full facepiece in areas of "nuisance" concentrations of contaminants or toxic dusts.

Approved by the U. S. Bureau of Mines, the half mask is also employed as a component part of similar dust, chemical cartridge, and air line respirators.

PORTABLE P.A. SYSTEM

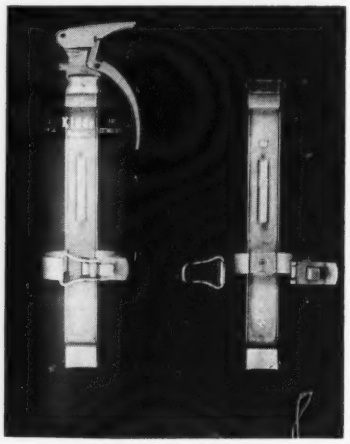
■ The added convenience of hand-free operation has been incorporated in a newly designed portable public address system now being produced by **Polaris Electronics Corp., Kansas City, Mo.**

The addition of a headset microphone and neck strap permits the user complete freedom of movement and releases the hands from carrying duties characteristic of some earlier models, the manufacturers state.

The unit, equipped with a 15 Watt transistorized amplifier and weighing only 6½ lbs., is particularly adaptable to P. A. requirements of police and fire departments, construction firms, instructors of outdoor groups, demonstrators, and the military, the firm points out.

The battery powered unit is equipped with an external power supply receptacle and also offers such optional equipment as an adapter cord for auto cigarette lighter outlets and a microphone extension cord. Battery life is said to average 50-100 hours.

CLAMPING BAND BRACKET



■ A new firm grip clamping band bracket for the Kidde Kompact 2½ pound dry chemical portable extinguisher is purchasable from **Walter Kidde & Company, Inc.** Made of cadmium plated steel, extra strong for severe vibration locations such as on heavy vehicles.

The new bracket's toggle release device permits the extinguisher to be freed of the bracket with the pull of a finger. This means getting it into operation faster in a fire emergency.

Trade News

Vernon Haack Joins Staff of Walter Kidde

VERNON R. HAACK has been appointed Dallas regional manager for the Industrial and Marine Division, Walter Kidde and Co. Inc., (Belleville, N.J.). He previously served as district sales manager at Kidde's Detroit regional office.

Mr. Haack has spent 14 years in the fire safety equipment field and joined Kidde in 1958. He attended Lawrence College.

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***Two new chapters—Nutmeg and Greater Tidewater—were approved at the Executive Committee Meeting, October 14, 1961.*

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Your status within the safety profession is enhanced by membership in the oldest and largest Society made up exclusively of professional safety engineers . . .

You receive the JOURNAL on a regular monthly basis and through it have access to the presentation of technical papers, research findings and the exchange of ideas . . .

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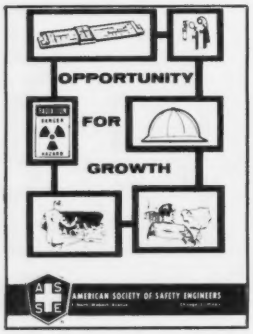
You can assist in the development and review of data sheets and other technical and safety materials and work with others in furthering the aims of your profession . . .

Your local chapter's meetings, workshops and discussions will increase your knowledge and with it your value to your community, your employer and the employes whose safety may be in your hands . . .



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